

# EXHIBIT “A”

UNITED STATES  
PATENT AND TRADEMARK OFFICEP.O. Box 1450  
Alexandria, VA 22313 - 1450  
www.uspto.gov

## ELECTRONIC PAYMENT RECEIPT

APPLICATION #  
**90/019,263**RECEIPT DATE / TIME  
**10/03/2023 05:04:07 PM ET**ATTORNEY DOCKET #  
**TAN048 00801**

### Title of Invention

LIGHT ELECTRIC OFF-ROAD MOTORCYCLE

### Application Information

APPLICATION TYPE Design / ex parte reexam

PATENT # D854456

CONFIRMATION # 7304

FILED BY Loretta Nocella

PATENT CENTER # 62921403

AUTHORIZED BY Richard Gilly

CUSTOMER # 151692

FILING DATE -

CORRESPONDENCE  
ADDRESS -FIRST NAMED  
INVENTOR Bing LI

### Payment Information

PAYMENT METHOD  
DA / 503443PAYMENT TRANSACTION ID  
E202303H04479302PAYMENT AUTHORIZED BY  
Loretta NocellaPRE-AUTHORIZED ACCOUNT  
503443PRE-AUTHORIZED CATEGORY  
37 CFR 1.21 (Miscellaneous fees and charges)

FEE CODE	DESCRIPTION	ITEM PRICE(\$)	QUANTITY	ITEM TOTAL(\$)
2831	EX PARTE REEXAMINATION ( 1.510(A)) STREAMLINED	2520.00	1	2520.00
TOTAL AMOUNT:				<b>\$2,520.00</b>

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

#### New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re:	<i>EX PARTE</i> REEXAMINATION OF )	Third Party Requestor:
	U.S. PATENT NO. D854,456 )	
Issued:	7/23/2019 )	Tanli Power Technology (Chongqing)
	)	Co., Ltd.
Patent No.:	D854,456 )	
	)	
Inventor:	BING LI, YINGHONG CAO, )	
	SHENG CHEN, KE MA )	
	)	
Assignee:	CHONGQING QIULONG )	
	TECHNOLOGY CO. LTD )	
	)	
Title:	Light Electric Off-Road Motorcycle )	
	)	

---

**REQUEST FOR EX PARTE REEXAMINATION OF U.S. PATENT NO. D854,456**

TO THE COMMISSIONER OF PATENTS:  
P.O. BOX 1450  
Alexandria, VA 22313

This is a request for *ex parte* reexamination (“Request”) under 35 U.S.C. §§ 301-307 and 37 C.F.R. § 1.510 *et seq.* of U.S. Patent No. D854,456 (“the ‘456 Patent”), issued on July 23, 2019 to Bing Li, Yinghong Cao, Sheng Chen and Ke Ma, and assigned to Chongqing Qiulong Technology Co. LTD. The ‘456 Patent was filed June 16, 2017, refers to a foreign priority from patent application number (CN) 201730077820.5, of March 16, 2017. A copy of the ‘456 Patent is submitted with this Request as Exhibit A.

**I. Introduction**

As demonstrated hereinbelow, this Request raises substantial new questions of patentability of the sole claim in the ‘456 Patent. Specifically, a European Registered Design for a motorcycle, Registration EM2998492 (“the ‘492 Design,” Exhibit B), was not cited during prosecution of the ‘456 Patent, is not cumulative of the prior art of record for the ‘456 Patent, and

anticipates the ‘456 Patent under 35 U.S.C. § 102, because it is substantially the same as the claimed design.

Alternately, the ‘456 Patent is obvious from the European Registered Design EM2998492, entitled “Motorcycle” (“the ‘492 Design”), in that the ‘492 Design is basically the same as the design of the ‘456 Patent, or in view of one or both of two, additional prior art references. Neither of these two additional, prior art references were before the U.S. Patent and Trademark Office (“USPTO”), and neither are cumulative of the art of record, namely, prior-art U.S. Pat. Pub. US2015/0122568, assigned to Suzuki Motor Corp., and entitled “Frame Structure for Electric Motorcycle and Support Structure for Electric Motor” (“Suzuki,” Exhibit C), and the Audi e bike worthersee, published by Designboom (“Audi,” Exhibit D).

The ‘492 Design has an effective date of February 23, 2016, and thus constitutes prior art to the ‘456 Patent. The ‘492 Design anticipates or renders obvious and unpatentable the ‘456 Patent.

Similarly, Suzuki and Audi are considered prior art to the ‘456 Patent under 35 U.S.C. sections 102 and 103. Suzuki has an effective filing date of November 5, 2013, and was published on May 7, 2015. Audi was published by Designboom and available on the world-wide web on May 23, 2012, at <https://www.designboom.com/technology/audi-e-bike-worthersee/>, with a verifiable WaybackMachine archive of such page at [https://web.archive.org/web/20121001000000\\*/https://www.designboom.com/technology/audi-e-bike-worthersee/](https://web.archive.org/web/20121001000000*/https://www.designboom.com/technology/audi-e-bike-worthersee/), and a snapshot showing the Designboom site available and accessed by the public at least as early as November 28, 2012 (attached as Exhibit F).

Accordingly, reexamination is requested in view of the ‘492 Design as anticipating the ‘456 Patent, or as rendering the ‘456 Patent obvious, or as rendering the ‘456 Patent obvious in

view of the Suzuki reference and/or Audi reference. Requester respectfully requests that the Commissioner grant this Request for *Ex Parte* Reexamination of the ‘456 Patent, reexamine the sole design claim, and issue an initial Office Action rejecting the claim over at least the prior art discussed in this Request.

**Attachments:**

1. Certificate of Service to Patent Owner
2. IDS form PTO/SB/08a

**Exhibits:**

- A. U.S. Patent No. D854,456
- B. EU Design Registration EM2998492
- C. U.S. Pat. Pub. US2015/0122568
- D. Audi e bike Worthersee, Designboom, May 23, 2012
- E. Declaration of Wang Fan, Aug 2023.
- F. Wayback Machine Archive of Designboom.com of November 28, 2012

**II. Identification of Each Claim for Which Reexamination is Requested**

Reexamination of the single design patent claim of the ‘456 Patent is requested.

**III. Prior Art Relied Upon**

Reexamination is requested on the grounds of anticipation by the ‘492 Design. Alternately, reexamination is requested on the grounds of obviousness from the ‘492 Design, by itself, or in combination with the Suzuki reference or the Audi reference. All these references are separately listed on an accompanying form PTO/SB/429, attached hereto.

**IV. The ‘456 Patent**

The ‘456 Patent claims an ornamental design for a light electric off-road motorcycle. The application for the ‘456 Patent was filed on June 16, 2017, naming Bing Li, Yinghong Cao, Sheng

Chen and Ke Ma as the inventors. During prosecution of the '456 Patent, the USPTO required the Applicant to file replacement drawings which limited the claimed design to those features shown in solid lines, and excluded those features in phantom or broken lines from the claimed design.

The solid-lined portions of Figure 9 from the '456 Patent are representative of the claimed design and Fig. 9 is reproduced below, with reference numbers added as explained below:

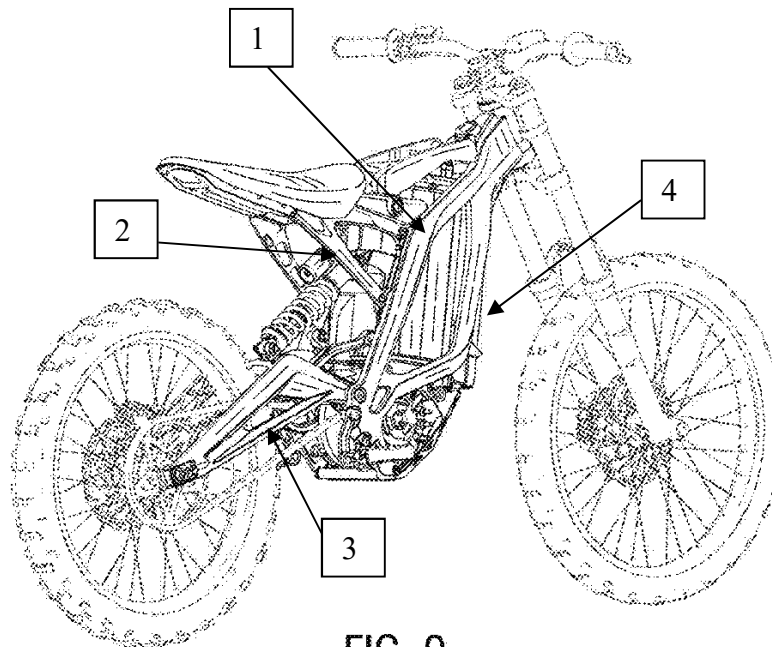


FIG. 9

Based on the figures and description of the claim, such as annotated Fig. 9 above, the following are the purported ornamental features that comprise the claimed ornamental design as a whole: (1) a motorcycle frame with side members tapered to an acute angle at the leading or forward end of the motor bike; (2) a seat support secured to the motorcycle frame by two acutely angled support members connected between the saddle and the side members of the frame; (3) a swing arm assembly having upper and lower members and a suspension spring, the upper member defining an apex with an obtuse angle, and the suspension spring secured at an acute angle relative

to the swing arm between the apex and the above-identified frame; and (4) a planar body panel on the forward end of the frame.

**V. Statement Pointing Out Each Substantial New Question of Patentability**

The ‘492 Design itself is substantially the same as the claimed design of the ‘456 Patent taken as a whole and therefore anticipates the ‘456 Patent, including the four design features enumerated above, and in a manner which is not cumulative of the prior art references before the USPTO. Alternatively, the ‘492 Design itself is basically the same as the claimed design of the ‘456 Patent, and therefore renders the ‘456 Patent obvious. Among those references which were before the USPTO, U.S. Design Patent D523,783 (“the ‘783 Patent”) and U.S. Design Patent D581,840 (“the ‘840 Patent”) are representative, and they do not disclose the claimed ornamental design to an ordinary observer, including the four features enumerated above, to the same degree of substantial similarity as done by the ‘492 Design.

The same is the case for the Suzuki and Audi references, which disclose one or more of the features of the claimed design non-cumulatively to the cited prior art.

Accordingly, reexamination of the claim of the ‘456 Patent is requested based on the following substantial new questions of patentability:

1. Whether the claim of the ‘456 Patent is anticipated by the ‘492 Design, which constitutes prior art, which discloses a design that is substantially the same as the ‘492 Design, and which that was not previously cited; and/or
2. Whether the claim of the ‘456 Patent is obvious in that it is basically the same as the design of the ‘492 Design itself, or in view of the related Suzuki or Audi references, and all of which references were not cited to the USPTO and are noncumulative of the cited prior art.



**VI. Detailed Explanation of the Pertinency and Manner of Applying the Cited Prior Art**

**A. The claim of the ‘456 Patent is anticipated under 35 U.S.C. § 102 by the ‘492 Design.**

**1. The standard for finding anticipation of a US design patent in a reexamination**

The standard for anticipation to be applied in a reexamination of a US design patent is set out in *International Seaway Trading Corp. v. Walgreens Corp.*, 589 F.3d 1233, 1241 (Fed. Cir. 2009), in which the Federal Circuit held that the ordinary observer test, the test used for design patent infringement, is “the sole test for invalidity under section 102.” Further, *Seaway* at 1243 states that “The ordinary observer test requires consideration of the design as a whole;” citing *Egyptian Goddess, Inc. v. Swisa, Inc.*, (543 F. 3d 665) (Fed. Cir. 2008). “[t]he ordinary observer test originated in 1871 when the Supreme Court held that if, in the eye of an ordinary observer, giving such attention as a purchaser usually gives, two designs are substantially the same, if the resemblance is such as to deceive such an observer, inducing him to purchase one supposing it to be the other, the first one patented is infringed by the other,” citing *Gorham Mfg. Co. v. White*, 81 US 511, 528 (1871).

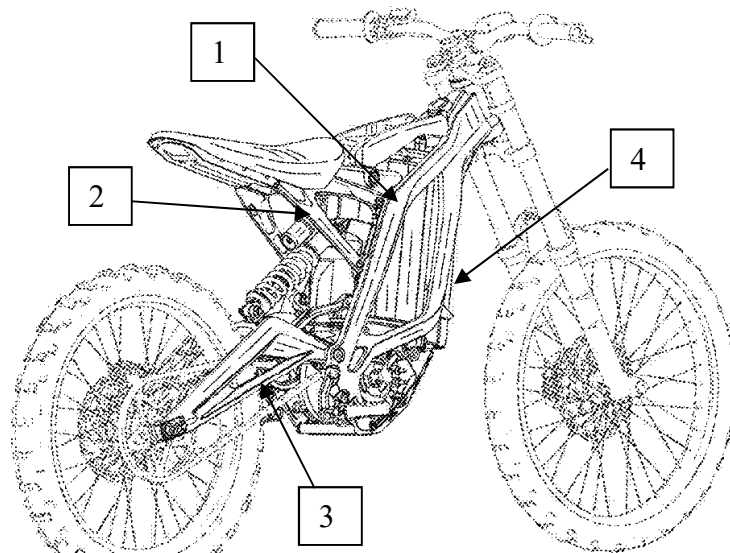
Additionally and importantly, *Seaway* at 1243 clarifies the issue relating to differences between the claimed design and the prior art relied upon as anticipatory:

The mandated overall comparison is a comparison taking into account significant differences between the two designs, not minor or trivial differences that necessarily exist between any two designs that are not exact copies of one another. Just as ‘minor differences between a patented design and an accused article's design cannot, and shall not, prevent a finding of infringement,’ ... so too minor differences cannot prevent a finding of anticipation.

*Seaway*, at 1243.

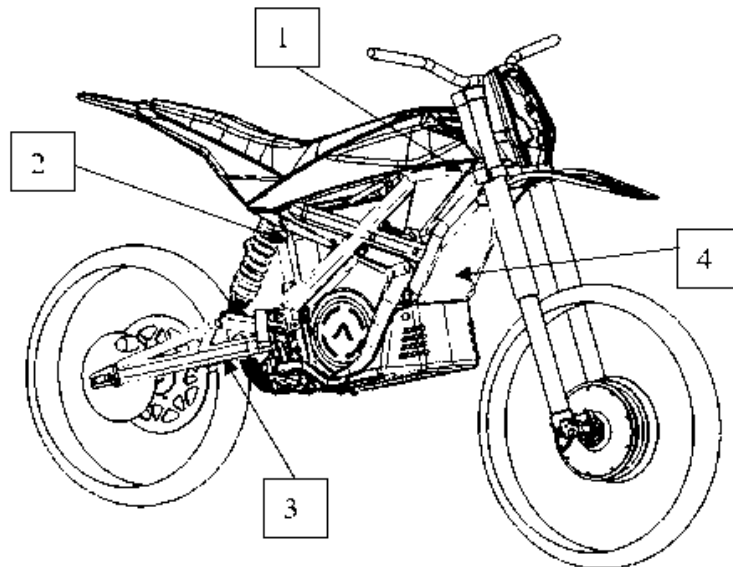
**2. Applying the standard to find anticipation of the ‘456 Patent by the ‘492 Design**

Applying the standard set forth above, the ‘492 Design anticipates the claimed design of the ‘456 Patent. When considering the designs as a whole, the design as set forth in ‘456 Patent is substantially the same as the ‘492 Design, as shown by side-by-side comparisons:



**FIG. 9**

**D854,456 (“the ‘456 Patent”) – Fig. 9 (reference numbers added)**



**Prior Art: EM2998492 (“the ‘492 Design”) – Fig. 2 (shading, reference numbers added)**

As seen by reviewing the above drawings from the ‘456 Patent and ‘492 Design, respectively, the ‘492 Design discloses to an ordinary observer, under the applicable *Seaway* test, the claimed invention as a whole, including the solid-lined, claimed features of: (1) a motorcycle frame with side members tapered to an acute angle at the leading or forward end of the motorcycle; (2) a seat support secured to the motorcycle frame by two acutely angled support members connected between the saddle and the side members of the frame; (3) a swing arm assembly having upper and lower members and a suspension spring, the upper member defining an apex with an obtuse angle, and the suspension spring secured at an acute angle relative to the swing arm between the apex and the above-identified frame; and (4) a planar body panel on the forward end of the frame.

The above analysis is a far closer inspection and comparison than would be performed by the ordinary observer under the *Seaway* test, and far more rigorous than the law requires for anticipation. To the extent that there are any differences between the two designs, as per *Seaway* at 1243 as stated above, the differences at most are minor. For that reason, viewed as a whole, as the law requires, the two designs are substantially the same as a matter of precedent as set forth in the anticipation standard for reexamination. For the reasons above, the claimed design of the ‘456 Patent is anticipated by the ‘492 Design.

**B. The claim of the ‘456 Patent is unpatentable under 35 U.S.C. § 103 as obvious from the ‘492 Design, in view of the identified prior art.**

**1. The standard for a finding of obviousness of a US design patent in a reexamination**

The standard for determination of obviousness in a reexamination of a US design patent is stated in *Apple Inc. v. Samsung Electronics Co., Ltd.*, 678 F3d 1314, 1329 (Fed. Cir. 2012): “In addressing a claim of obviousness in a design patent, ‘the ultimate inquiry ... is whether the claimed design would have been obvious to a designer of ordinary skill who designs articles of the type

involved.’ *Titan Tire*, 566 F.3d at 1375, quoting *Durling v. Spectrum Furniture Co.*, 101 F.3d 100, 103 (Fed.Cir.1996). To determine whether ‘one of ordinary skill would have combined teachings of the prior art to create the same overall visual appearance as the claimed design,’ *id.* at 1381, the finder of fact must employ a two-step process. First, “‘one must find a single reference, a something in existence, the design characteristics of which are basically the same as the claimed design.’” *Durling*, 101 F.3d at 103, quoting *In re Rosen*, 673 F.2d 388, 391 (CCPA 1982). Second, ‘other references may be used to modify [the primary reference] to create a design that has the same overall visual appearance as the claimed design.’ *Id.* However, the secondary references may only be used to modify the primary reference if they are “‘so related to the primary reference that the appearance of certain ornamental features in one would suggest the application of those features to the other.’” *Id.*, quoting *In re Borden*, 90 F.3d 1570, 1575 (Fed.Cir.1996).

As to the requirement that the secondary and primary references be “so related,” the *Borden* case cites *In re Glavas*, 230 F.2d 447, 450 (C.C.P.A. 1956) which states “Generally speaking, the references so combined in the reported cases have related to designs for the same or similar types of devices, and it is noted that the examiner, in the instant case, stated that the pillow art, from which he selected his auxiliary references, was related to that of floats since seat cushions are frequently made buoyant to serve as floats in emergencies.” Notably, the *Borden* decision also cites *In re Sung Nam Cho*, 813 F.2d 378 (Fed. Cir. 1987) which, at 382 sets forth the test for qualifying one skilled in the art for these purposes: “The relevant viewer for such suggestion is a designer of ordinary capability who designs articles of the type presented.”

Once so qualified, the role of the designer of ordinary capability has been limited by the Federal Circuit in *International Seaway Trading Corp.* at 1240:

For design patents, the role of one skilled in the art in the obviousness context lies only in determining whether to combine earlier references to arrive at a single piece

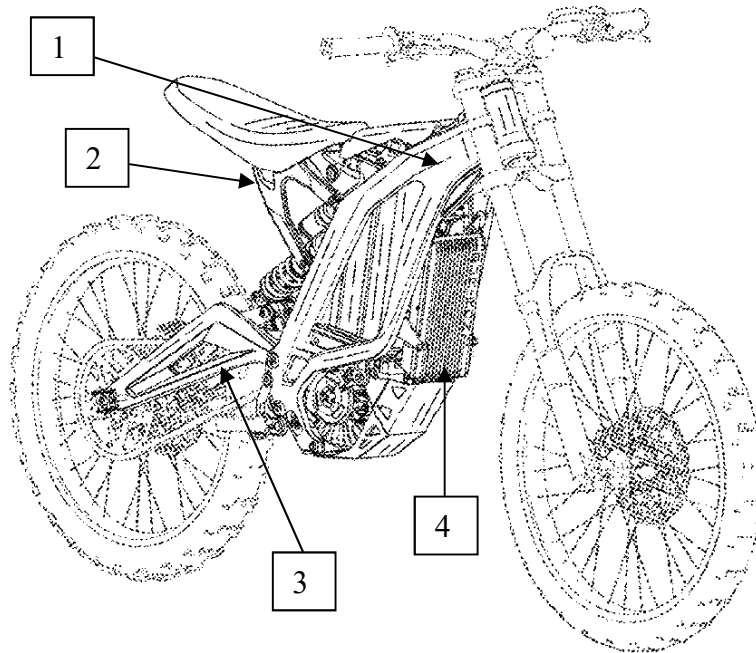
of art for comparison with the potential design or to modify a single prior art reference. Once that piece of prior art has been constructed, obviousness, like anticipation, requires application of the ordinary observer test, not the view of one skilled in the art.

*International Seaway Trading Corp.*, at 1240.

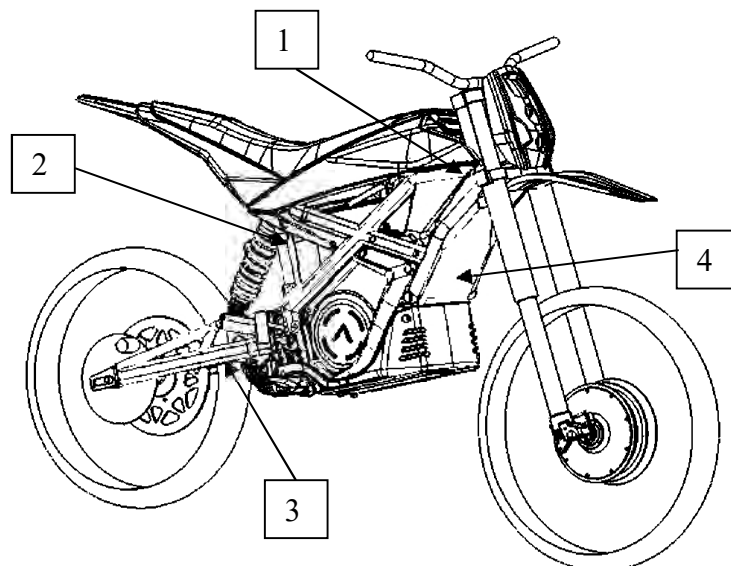
While *Rosen* at 391 states that “other references may be used,” once the primary reference is found, a determination of obviousness under Section 103 may be made with respect to a single reference. See, eg, *Arendi S.A.R.L. v. Apple Inc.*, 832 F. 3d 1355 (Fed. Cir. 2016) which states at 1361: “Though less common, in appropriate circumstances, a patent can be obvious in light of a single prior art reference if it would have been obvious to modify that reference to arrive at the patented invention.”

**2. Applying the standard to find the ‘456 Patent claim obvious in view of the ‘492 Design.**

As set forth above, the claimed design is substantially the same as the design of the product shown in the ‘492 Design reference, and therefore unpatentable under 35 U.S.C. § 102. Alternatively, the design disclosed in the ‘492 Design is basically the same as the ‘456 Design and as such renders the ‘456 Design obvious to the ordinary observer under Section 103 because, as seen by the additional views of the ‘492 Design and the ‘456 Patent reproduced below, it is well within the skill of the ordinary designer to modify the single ‘492 Design reference itself to erase any such differences, as contemplated by *Arendi*, at 1361.



**‘456 Patent Fig. 7 (reference numbers added)**



**Prior Art: EM2998492 (“the ‘492 Design”) – Fig. 2 (shading, reference numbers added)**

Therefore, as seen from the above-illustrated designs, a designer of ordinary capability who designs motorcycle frames would recognize that the ‘492 Design, entitled “Motorcycle,” is an electric-motor powered cycle, as is the ‘456 Patent. The designs are not only closely related as to motorcycles, but even more closely, as to electric-motor powered cycles. (See Declaration of

Wang Fan, Exhibit E, ¶12 (hereinafter “Fan”)). Accordingly, because the ‘492 Design is basically the same as the ‘456 Design it would be obvious to the designer of ordinary skill to adjust the overall design of the ‘492 Design to replicate the ornamental features of the ‘456 Patent, including changing the pitch of the grooves already located on the front body panels of the ‘492 Design (feature (4)), or altering the already-existing taper of the already-existing side members at the forward end of the motorcycle (feature (1)). (Fan ¶ 13). Furthermore, with regard to the pitch of the grooves, alteration is all the more likely by a designer in this case, as the ornamental aspects of elongated elements on body cover panels are often limited by functional requirements to provide radiative cooling through such elongated structures, such as louvers or slots, as is the case of panel (4) of the ‘492 Design and ‘456 Patent. (Fan ¶ 14).

**3. Applying the standard to find the ‘456 Patent claim obvious by applying the ‘492 Design as a primary reference in view of certain secondary references.**

In the alternative, it is respectfully submitted that comparing the ‘492 Design (that is basically the same as the design in issue) as a primary reference under the applicable obviousness standard to the design of the ‘456 Patent, and then intoning a secondary reference “related” to the ‘492 Design under *Borden*, also makes out a finding of obviousness of the ‘456 Patent. It is respectfully submitted that there are two such references “related” in the manner required by *Borden* and cases it cites: the Suzuki reference and the Audi reference, each of which are discussed separately below.

**a. The Suzuki reference as a secondary reference “related” under *Borden* to the ‘492 Design as a primary reference:**

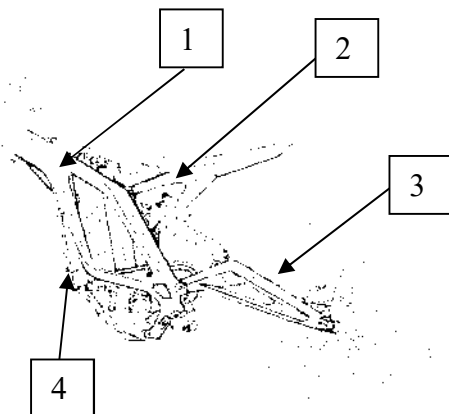
The ‘492 Design and the Suzuki reference are “related” under *Borden* as further clarified in *In re Glavas*, given that both references are owned by entities, Visionar S.R.L of Montefano, Italy, and Suzuki Motor Corp., that design, manufacture, and sell motorcycles, and were filed

within a few years of each other, all as shown in Exhibit B and Exhibit C. It is beyond cavil that under *Glavas* the references meet the “related” test of *Borden*.

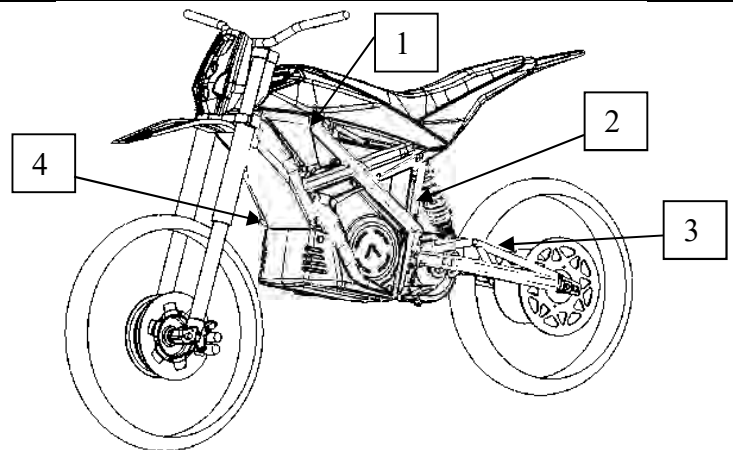
As seen in the below, side-by-side comparisons, the ‘492 Design shows all the same features of the claimed overall design of the ‘456 Patent, including features (1) through (4). To the extent there are not merely minor differences between the overall design of the ‘492 Design and the ‘456 Patent, such as in the swing arm assembly feature (3), given the Suzuki reference, adjustments in the cross-section of the swing arm members to obviate non-minor differences is well within the skillset of “a designer of ordinary capability who designs” motorcycles (Fan ¶ 15), as and per *In re Sung Nam Cho*.

**‘456 Patent**

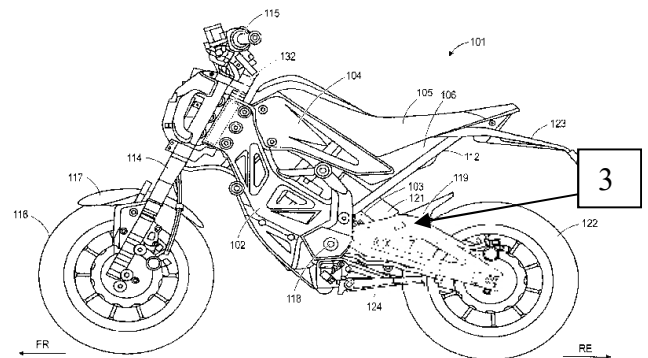
**Prior Art**



**‘456 Patent Fig. 2 (reference numbers added)**



**EM2998492 (“‘492 Design”) – Fig. 1  
(shading, reference numbers added)**



**Suzuki – Fig. 2  
(shading, reference numbers added)**



As such, the ‘492 Design, were it considered to be a primary reference for obviousness, rather than anticipatory as outlined above, the Suzuki reference would be a secondary reference combinable as “related” to the ‘492 Design by one of ordinary capability in designing motorcycle frames, as per *Sung Nam Cho*, since the ‘492 Design and Suzuki both relate to electric motor powered cycles (Fan ¶ 15). The Suzuki reference provides a teaching to modify the swing arm assembly feature (3) of the ‘492 Design so as to have the appearance of the swing arm of the ‘456 Patent. See, eg. *Ex parte Jae-Myoung Lee*, Decision of the Patent Trial and Appeal Board, Appeal 2017-001030, Application no. 29/426,619, Technology Center 2900, January 3, 2019 (“*Lee*”) at 12.

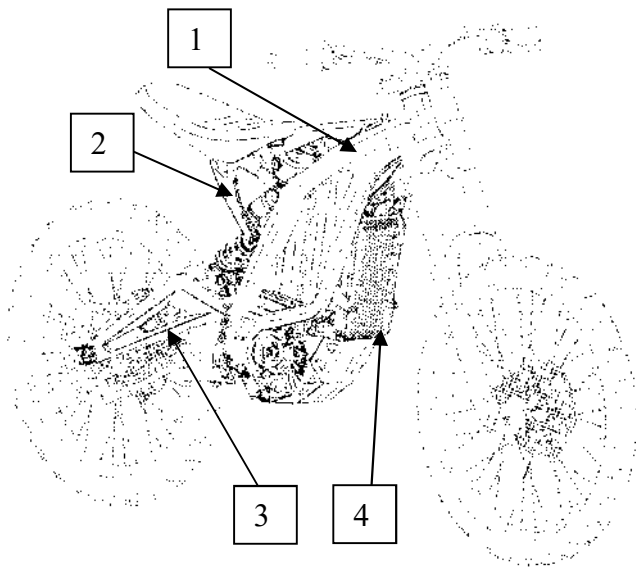
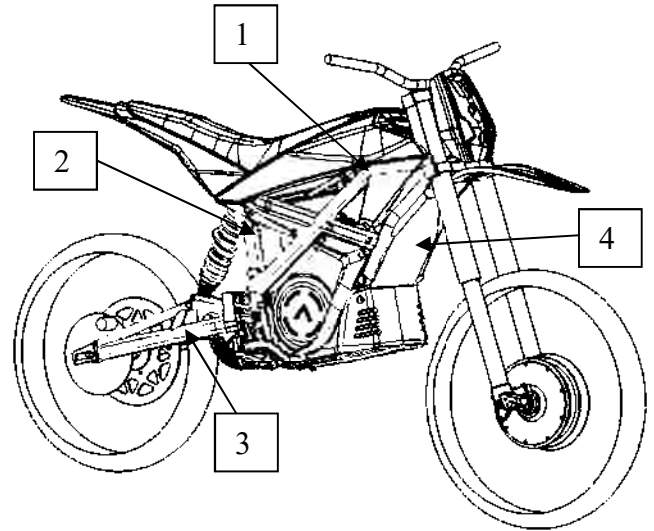
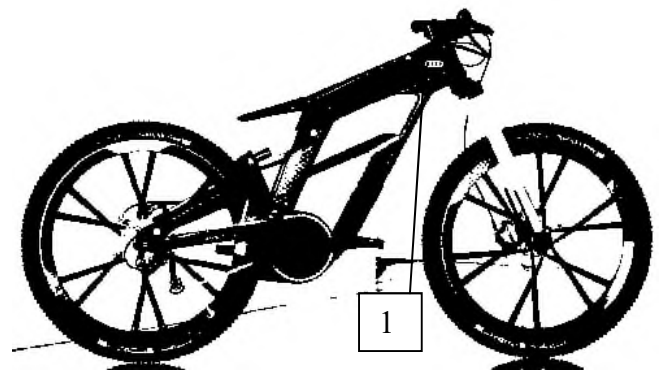
Therefore, under the *Seaway* test for obviousness, the ordinary observer would consider the ‘456 Patent as obvious in view of the resultant combined design of the ‘492 Design and Suzuki, when viewed as a whole.

**b. The Audi reference as a secondary “related” reference under *Borden* to the ‘492 Design as a primary reference:**

The Audi reference discloses a prior-art electric bike or e-bike with basically the same design features as found in the ‘456 Patent and the ‘492 Design, including in particular a frame having two side-frame members with contoured cross sections and meeting at an acute angle at the forward end of the cycle.

The ‘492 Design and the Audi reference are “related” under *Borden* as further clarified in *In re Glavas*, given that both references are to electric motor powered cycles or electric motor powered bikes, as opposed to combustion engine powered vehicles. Electric-motor powered cycle and bike designers of ordinary skill consider the products related, aspire to the same forward acute-angle design aesthetic, and, in fact, marketing efforts often compare electric-powered motorcycles to electric bikes (Fan ¶¶ 16, 17, Fan Declaration Exhibit 1).

As seen in the below, side-by-side comparisons, again, the ‘492 Design shows basically the same features of the claimed overall design of the ‘456 Patent, including features (1) through (4). To the extent there were a determination that there were not merely minor differences between the overall design of the ‘492 Design and the ‘456 Patent, such as in the body frame (1), the Audi reference would be readily used to modify the ‘492 Design as needed to erase any such differences, including, for example, an adjustment in the contouring of the side frame members, because such adjustments would be well within the skillset of a designer of ordinary capability who designs motorcycles (Fan ¶ 18), and, in any event, are consistent with the obviousness standards set out in *In re Sung Nam Cho*.

**‘456 Patent****Prior Art****‘456 Patent Fig. 7 (reference numbers added)****EM2998492 (“the ‘492 Design”) – Fig. 2  
(shading, reference numbers added)****Audi Reference – Exh. D, p. 1  
(reference number added)**

As such, if the ‘492 Design were considered to be a primary reference for obviousness, rather than anticipatory as outlined above, the Audi reference would be a secondary reference combinable as “so related” with the ‘492 Design by one of ordinary capability in designing motorcycle frames as per *Sung Nam Cho*, especially given the common aspirations of such designers to the forward acute-angle aesthetic for body frames. The Audi reference provides a teaching to modify the motorcycle frame with side members tapered to an acute angle at the leading

or forward end of the motorcycle (1) of the ‘492 Design so as to have the appearance of the motorcycle frame of the ‘456 Patent. See, eg. *Lee, supra*.

**c. Combining either the Suzuki reference or the Audi reference as a secondary “related” reference with the ‘492 Design as a primary reference renders the ‘456 Patent obvious:**

Furthermore, either of the resultant combined designs, viewed by the ordinary observer as a whole, would render the ‘456 Patent obvious. Any differences that might be present between the ‘456 Patent in issue and the primary and secondary references discussed above, when taken as a whole, are likewise minor and do not depart from the overall design, and thus would not overcome a determination that the claimed design of the ‘456 Patent is obvious over the disclosure of ‘492 Design alone or in view of the disclosure of either of the other prior art references disclosed herein.

**C. Broadest Reasonable Interpretation Standard Before USPTO**

To the extent the above explanations construe the scope of the claim of D854,456 (the ‘456 Patent), it is understood that such constructions are in accordance with the broadest reasonable interpretation standards applicable to administrative proceedings before the U.S. Patent and Trademark Office, not principles and canons of claim construction applied by the Federal Courts. Accordingly, any such constructions proffered herein do not constitute admissions as to the scope of the design for purposes of litigation in Federal Courts, nor waivers of other constructions Requester may proffer before the USPTO and the Federal Courts, nor admissions or waivers as to functionality of purported ornamental features, or indefiniteness thereof, which constructions Requester may subsequently proffer in federal courts without being estopped hereunder.

**VII. Certifications**

The third party requestor certifies that the statutory estoppel provisions of 35 U.S.C. § 315(e)(1) and 35 U.S.C. § 325(e)(1) do not prohibit the requestor from filing the *ex parte* reexamination request. A certification of service is set forth below.

**VIII. Conclusion**

For the reasons stated above, reexamination of the claimed design of US Patent D854,456 is requested.

Respectfully submitted,

/Richard P. Gilly/

Richard P. Gilly, Esq.  
Reg. No. 37,630  
For Third-Party Requester  
Reg. No. 37,630  
Archer & Greiner, P.C.  
Three Logan Square  
1717 Arch Street, Suite 3500  
Philadelphia, PA 19103-2739  
T: 215-963-3300  
F: 215-963-9999  
E: rgilly@archerlaw.com

Attorneys for Requestors  
Tanli Power Technology (Chongqing) Co., Ltd.

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the REQUEST FOR *EX PARTE* REEXAMINATION OF U.S. PATENT NO. D854,456 along with all exhibits and supporting documentation has been served via USPS Priority Mail on October 3, 2023, upon the following:

Robert L. Wolter  
Wolter Van Dyke Davis, PLLC  
1900 Summit Tower Blvd.  
SUITE 140  
Orlando, FL  
UNITED STATES

/Richard P. Gilly/  
Richard P. Gilly, Esq.  
Reg. No. 37,630  
Archer & Greiner, P.C.  
Three Logan Square  
1717 Arch Street, Suite 3500  
Philadelphia, PA 19103-2739  
T: 215-963-3300  
F: 215-963-9999  
E: rgilly@archerlaw.com

Attorneys for Requestor  
Tanli Power Technology (Chongqing) Co., Ltd.

227628977 v2

# **EXHIBIT A**



US00D854456S

(12) **United States Design Patent**  
**Li et al.**

(10) **Patent No.:** **US D854,456 S**

(45) **Date of Patent:** **\*\* Jul. 23, 2019**

(54) **LIGHT ELECTRIC OFF-ROAD  
MOTORCYCLE**

(71) Applicant: **ChongQing Qiulong Technology Co.  
LTD.**, Chongqing (CN)

(72) Inventors: **Bing Li**, Chongqing (CN); **Yinghong  
Cao**, Chongqing (CN); **Sheng Chen**,  
Chongqing (CN); **Ke Ma**, Chongqing  
(CN)

(73) Assignee: **CHONGQING QIULONG  
TECHNOLOGY CO. LTD**, Chongqing  
(CN)

D384,601	S	*	10/1997	Hiruma	.....	D12/110
D395,849	S	*	7/1998	Maruyama	.....	D12/110
D419,922	S	*	2/2000	Yamase	.....	D12/110
D430,822	S	*	9/2000	Sakaguchi	.....	D12/110
D482,639	S	*	11/2003	Yamamoto	.....	D12/110
D497,329	S	*	10/2004	Yamamoto	.....	D12/110
D497,330	S	*	10/2004	Fukuyama	.....	D12/110
D513,481	S	*	1/2006	Lin	.....	D12/110
D517,956	S	*	3/2006	Kishi	.....	D12/110
D523,783	S	*	6/2006	Sugimoto	.....	D12/110
D524,191	S	*	7/2006	Sugimoto	.....	D12/110
D526,249	S	*	8/2006	Tanaka	.....	D12/110
D549,136	S	*	8/2007	Yu	.....	D12/110
D559,155	S	*	1/2008	Sakata	.....	D12/110
D566,626	S	*	4/2008	Sakata	.....	D12/110
D581,840	S	*	12/2008	Ichihara	.....	D12/110

(Continued)

(\*\*) Term: **15 Years**

(21) Appl. No.: **29/607,893**

(22) Filed: **Jun. 16, 2017**

(30) **Foreign Application Priority Data**

Mar. 16, 2017 (CN) ..... 2017 3 0077820

(51) **LOC (11) CL.** ..... **12-11**

(52) **U.S. CL.** ..... **D12/110**  
USPC

(58) **Field of Classification Search**  
USPC ..... D12/110, 111, 117; D21/432, 538  
CPC ..... B62K 11/00; B62K 11/02; B62K 11/04;  
B62K 11/10; B62K 17/00; B62K 19/00;  
B62K 2202/00

See application file for complete search history.

(56) **References Cited**

#### U.S. PATENT DOCUMENTS

D269,170	S	*	5/1983	Aoyama	.....	D12/110
D270,047	S	*	8/1983	Kataoka	.....	D12/110
D273,854	S	*	5/1984	Ishiyama	.....	D12/110
D384,600	S	*	10/1997	Miwa	.....	D12/110

*Primary Examiner* — Darlington Ly

(74) *Attorney, Agent, or Firm* — Beusse, Wolter, Sanks &  
Maire PLLC; Robert L. Wolter

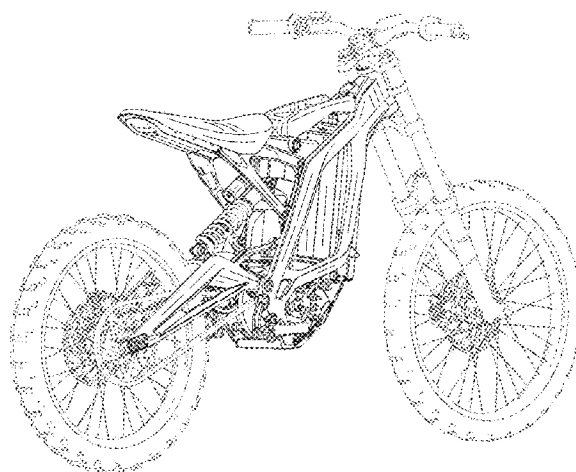
(57) **CLAIM**

The ornamental design for a light electric off-road motor-  
cycle, as shown and described.

#### DESCRIPTION

FIG. 1 is a right side elevation view of a light electric  
off-road motorcycle showing our new design;  
FIG. 2 is a left side elevation view thereof;  
FIG. 3 is a rear elevation view thereof;  
FIG. 4 is a front elevation view thereof;  
FIG. 5 is a top plan view thereof;  
FIG. 6 is a bottom plan view thereof;  
FIG. 7 is a front and right side perspective view thereof;  
FIG. 8 is a front and left side perspective view thereof;  
FIG. 9 is a rear and right side perspective view thereof; and,  
FIG. 10 is a rear and left side perspective view thereof.  
The broken lines in the drawings illustrate portions of the  
light electric off-road motorcycle that form no part of the  
claimed design.

**1 Claim, 5 Drawing Sheets**





**US D854,456 S**

Page 2

(56)

**References Cited**

## U.S. PATENT DOCUMENTS

D590,302	S	*	4/2009	Tanaka	.....	D12/110
D594,784	S	*	6/2009	Ichihara	.....	D12/110
D598,330	S	*	8/2009	Miyanishi	.....	D12/110
D601,927	S	*	10/2009	Watanabe	.....	D12/110
D603,300	S	*	11/2009	Fukuyama	.....	D12/110
D609,609	S	*	2/2010	Hayashi	.....	D12/110
D609,610	S	*	2/2010	Inose	.....	D12/110
D621,301	S	*	8/2010	Hayashi	.....	D12/110
D632,226	S	*	2/2011	Miyata	.....	D12/110
D640,173	S	*	6/2011	Oyanagi	.....	D12/110
D665,706	S	*	8/2012	Oyanagi	.....	D12/110
D685,682	S	*	7/2013	Matsumura	.....	D12/110
D724,496	S	*	3/2015	Takeda	.....	D12/110
D735,086	S	*	7/2015	Talios	.....	D12/110
D735,087	S	*	7/2015	Iimura	.....	D12/110
D738,260	S	*	9/2015	Akita	.....	D12/110
D738,789	S	*	9/2015	Inose	.....	D12/110
D754,567	S	*	4/2016	Iimura	.....	D12/110
D792,287	S	*	7/2017	Kobayashi	.....	D12/110
D798,195	S	*	9/2017	Yu	.....	D12/110
D809,433	S	*	2/2018	Kobayashi	.....	D12/110
2013/0313034	A1	*	11/2013	Matsushima	.....	B62K 11/00
						180/219
2015/0060178	A1	*	3/2015	Matsushima	.....	F02M 35/162
						180/219
2017/0057338	A1	*	3/2017	Inagaki	.....	B60K 11/08

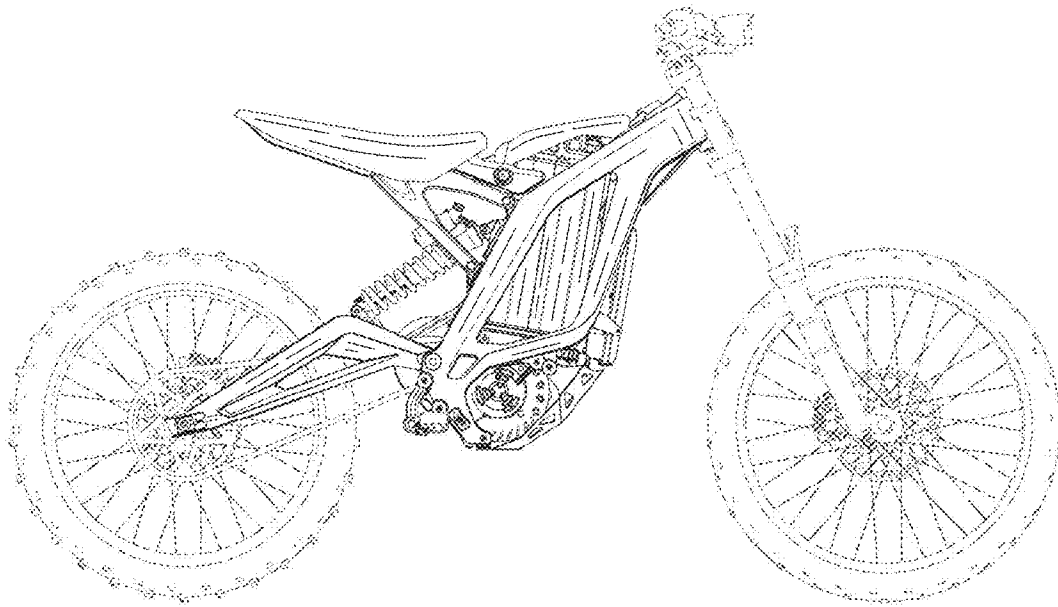
\* cited by examiner

**U.S. Patent**

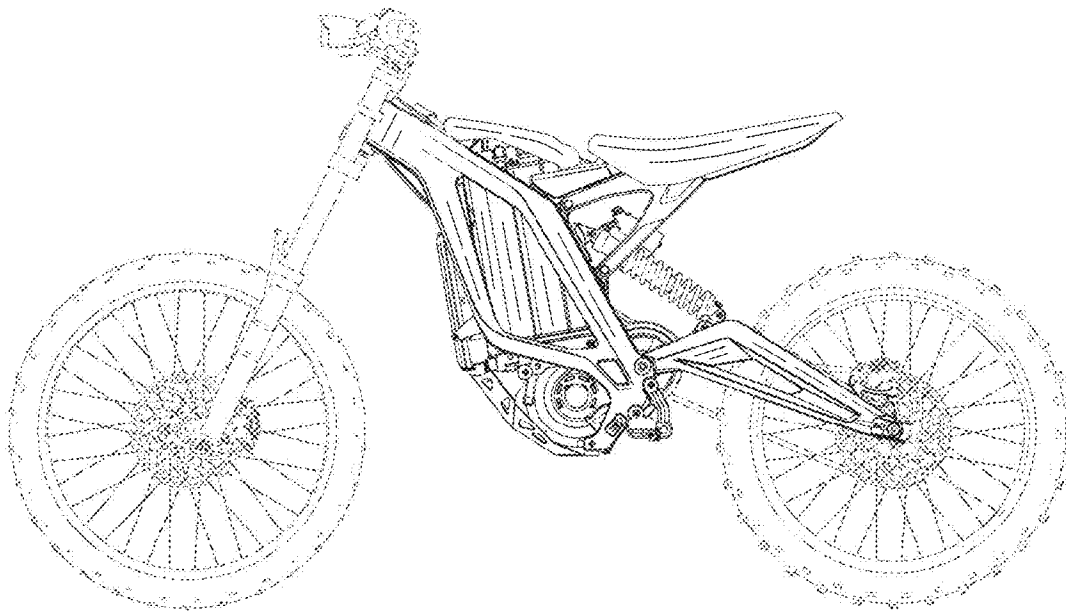
**Jul. 23, 2019**

**Sheet 1 of 5**

**US D854,456 S**



**FIG. 1**



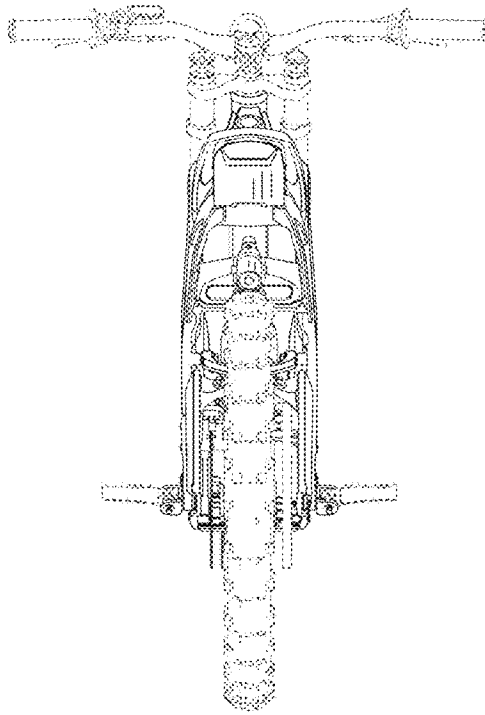
**FIG. 2**

**U.S. Patent**

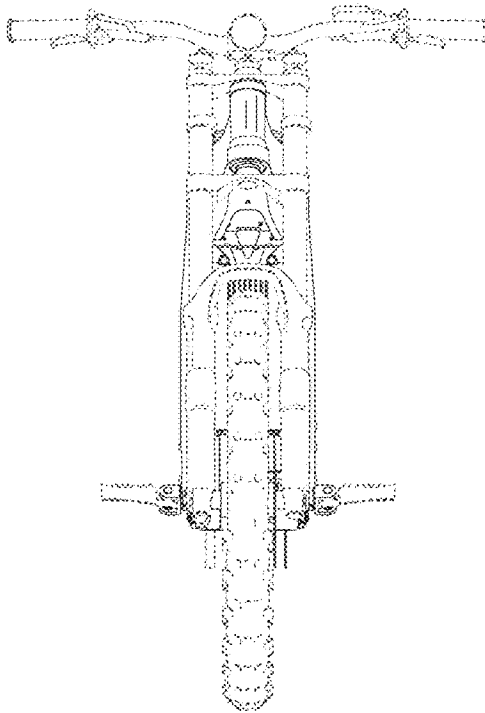
**Jul. 23, 2019**

**Sheet 2 of 5**

**US D854,456 S**



**FIG. 3**



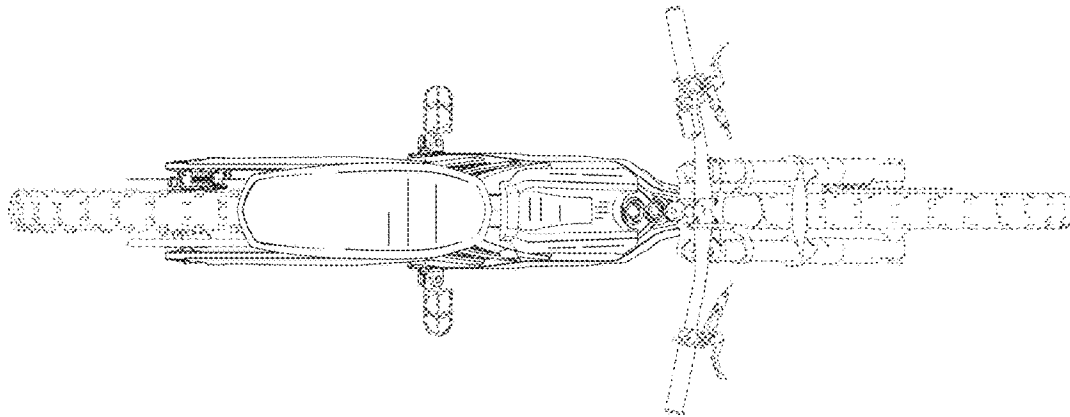
**FIG. 4**

**U.S. Patent**

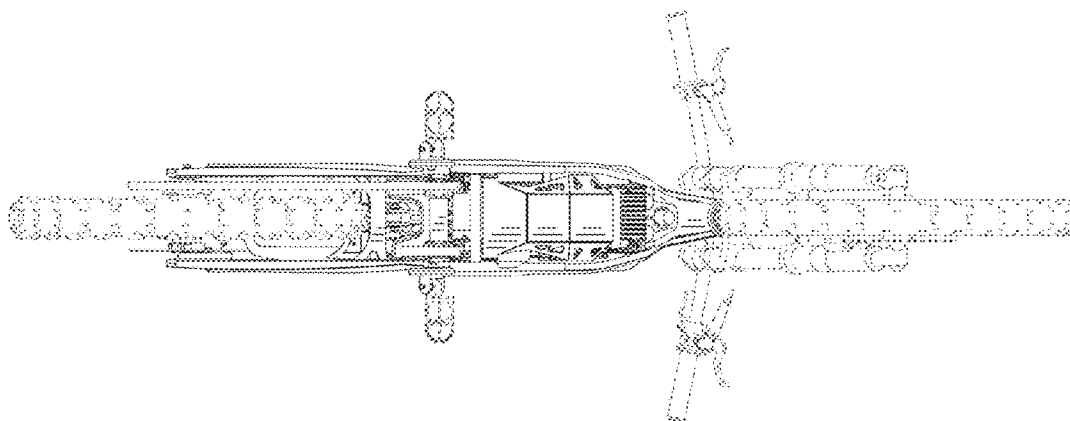
**Jul. 23, 2019**

**Sheet 3 of 5**

**US D854,456 S**



**FIG. 5**



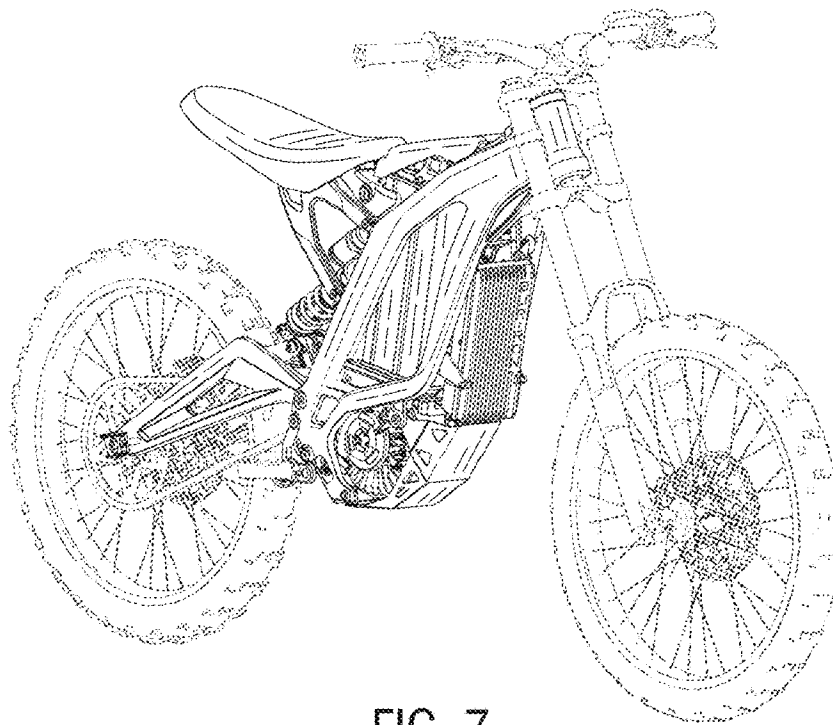
**FIG. 6**

**U.S. Patent**

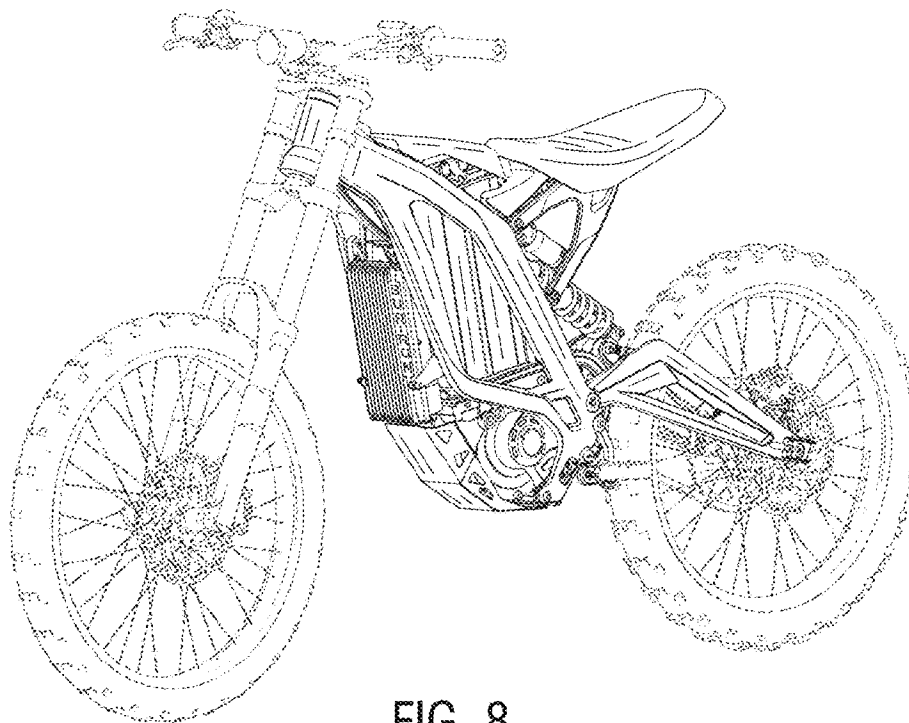
**Jul. 23, 2019**

**Sheet 4 of 5**

**US D854,456 S**



**FIG. 7**



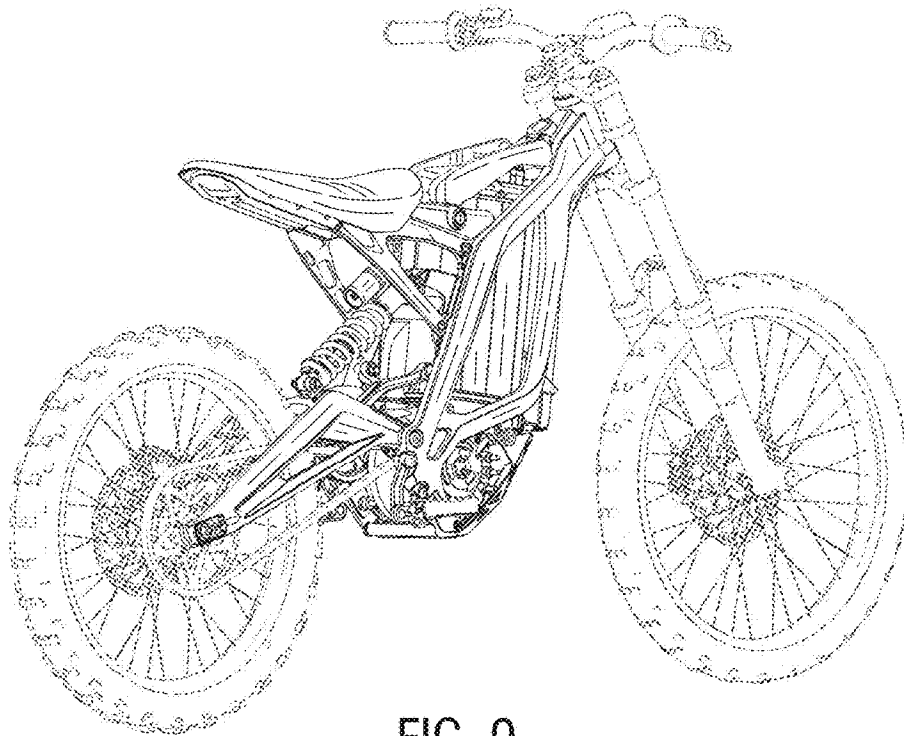
**FIG. 8**

**U.S. Patent**

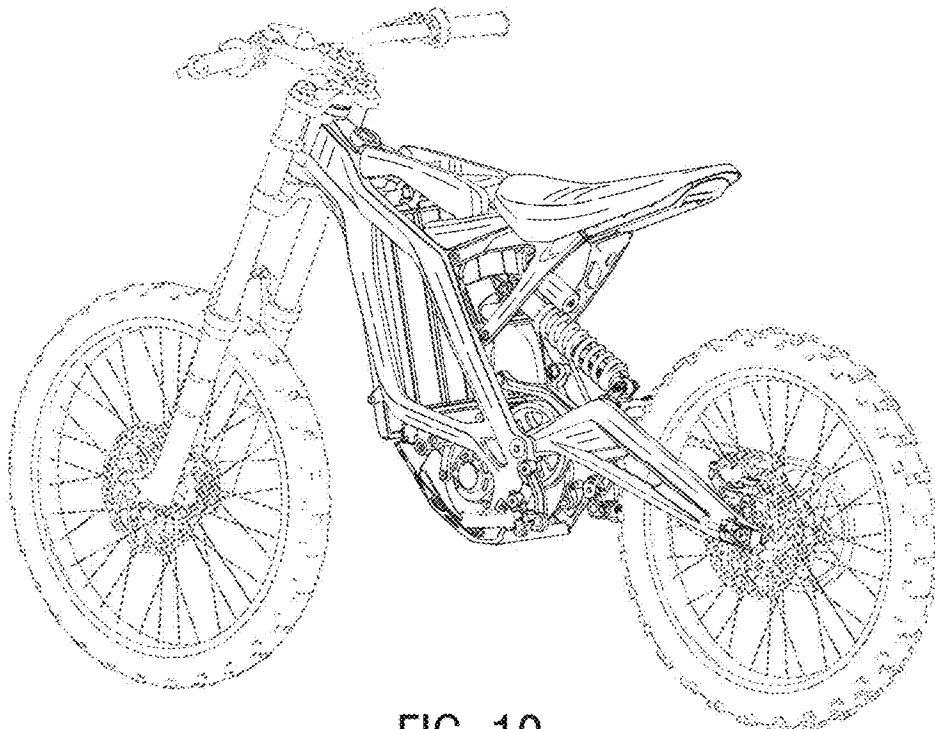
**Jul. 23, 2019**

**Sheet 5 of 5**

**US D854,456 S**

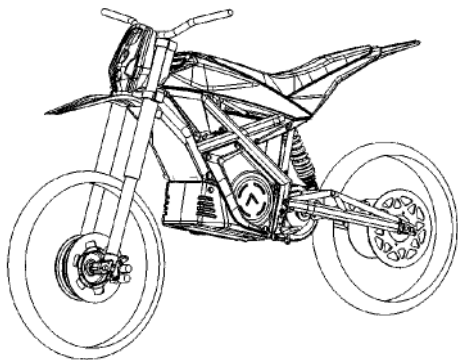


**FIG. 9**



**FIG. 10**

# **EXHIBIT B**



## Motocicletta

Locarno classification	12.11
Domestic classification	
Design number	<u>002998492-0002</u>
Application number	<u>002998492</u>
Registration office code	EM
Application language code	it
Application date	23/02/2016
Registration date	23/02/2016
Publication date	25/02/2016
Design description	No
Expiry date	23/02/2021
Effective date	23/02/2016
Design current status code	Design lapsed
Design current status date	31/12/2021
Comment	



**Owner**

Applicant Identifier	705698
Owner name	VISIONAR S.R.L.
Applicant legal entity	Legal Entity
Applicant nationality code	IT
Address	Via Beato Amico 37
City	MONTEFANO
Postcode	62010
Country code	IT

**Representative**

Representative identifier	14750
Representative's name	ING. CLAUDIO BALDI S.R.L.
Applicant legal entity	Legal Person
Representative nationality code	IT
Address	Viale Cavallotti, 13
City	Jesi (Ancona)
Postcode	60035
Country code	IT

**Correspondence address**

No entry for the design no

**Exhibition Priority**

No entry for the design no

**Priority**

No entry for the design no

**Publication**

Publication identifier	Publication section	Date	Page
2022/002	C.2	04/01/2022	
2016/038	A.1	25/02/2016	

## DESIGNER

No entry for the design no

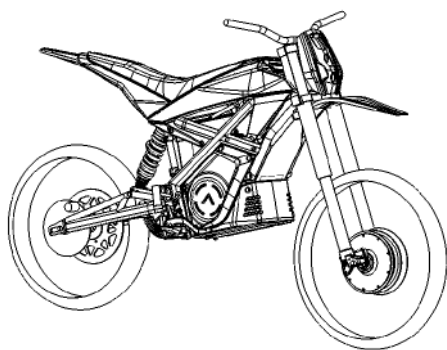
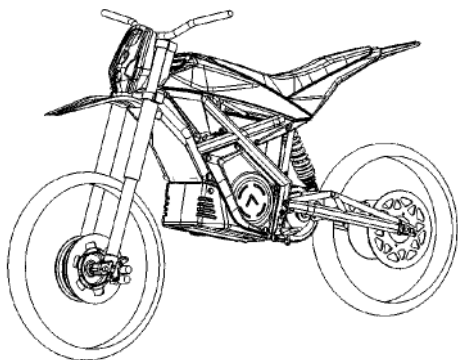
## Renewals

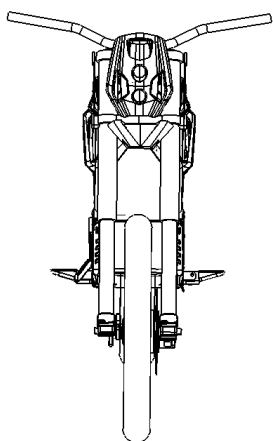
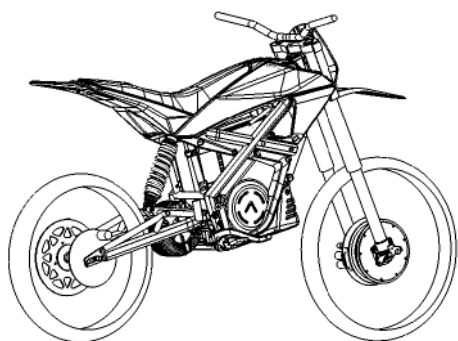
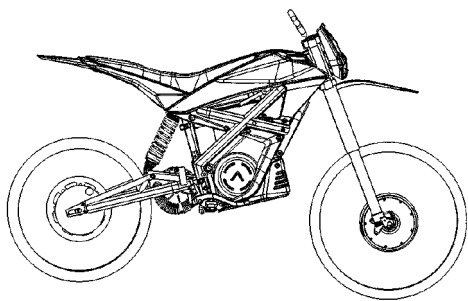
No entry for the design no

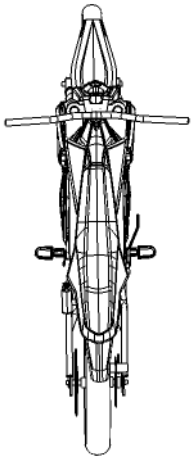
## Recordals

No entry for the design no

## Representation (views of design)







# **EXHIBIT C**



US 20150122568A1

(19) **United States**(12) **Patent Application Publication**  
**EGUCHI**(10) **Pub. No.: US 2015/0122568 A1**(43) **Pub. Date: May 7, 2015**(54) **FRAME STRUCTURE FOR ELECTRIC  
MOTORCYCLE AND SUPPORT STRUCTURE  
FOR ELECTRIC MOTOR****Publication Classification**(51) **Int. Cl.***B62K 11/04* (2006.01)*B62H 1/02* (2006.01)*B62J 1/08* (2006.01)*B62K 25/04* (2006.01)(52) **U.S. Cl.**CPC ..... *B62K 11/04* (2013.01); *B62K 25/04*(2013.01); *B62H 1/02* (2013.01); *B62J 1/08*(2013.01); *B62K 2204/00* (2013.01)(71) Applicant: **SUZUKI MOTOR CORPORATION,**  
Hamamatsu-shi (JP)(72) Inventor: **Teppei EGUCHI,** Hamamatsu-shi (JP)(21) Appl. No.: **14/528,713**(22) Filed: **Oct. 30, 2014**(30) **Foreign Application Priority Data**

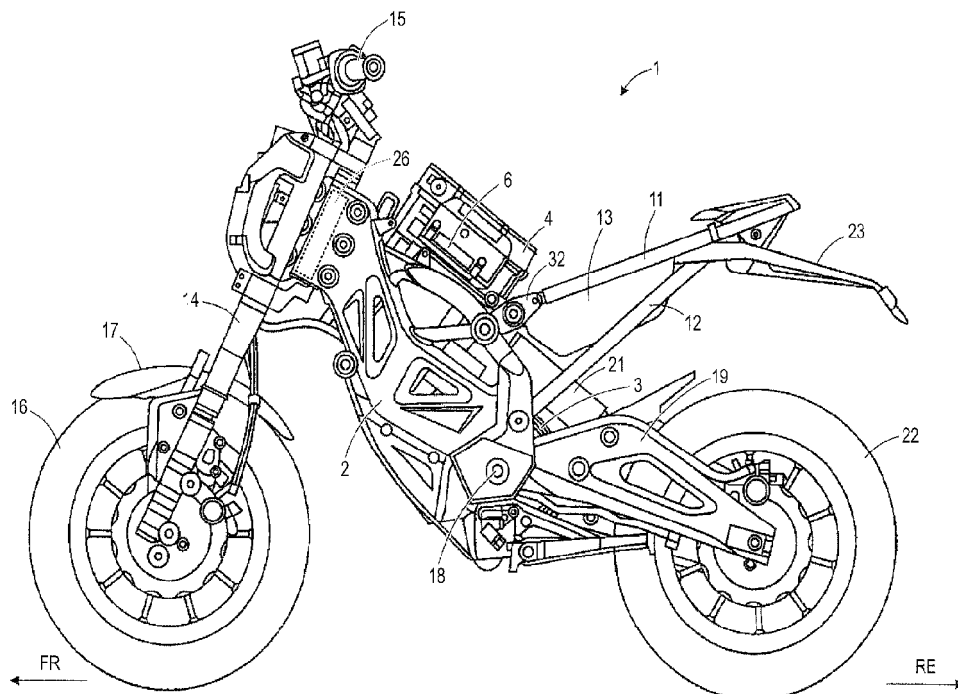
Nov. 5, 2013 (JP) ..... 2013-229490

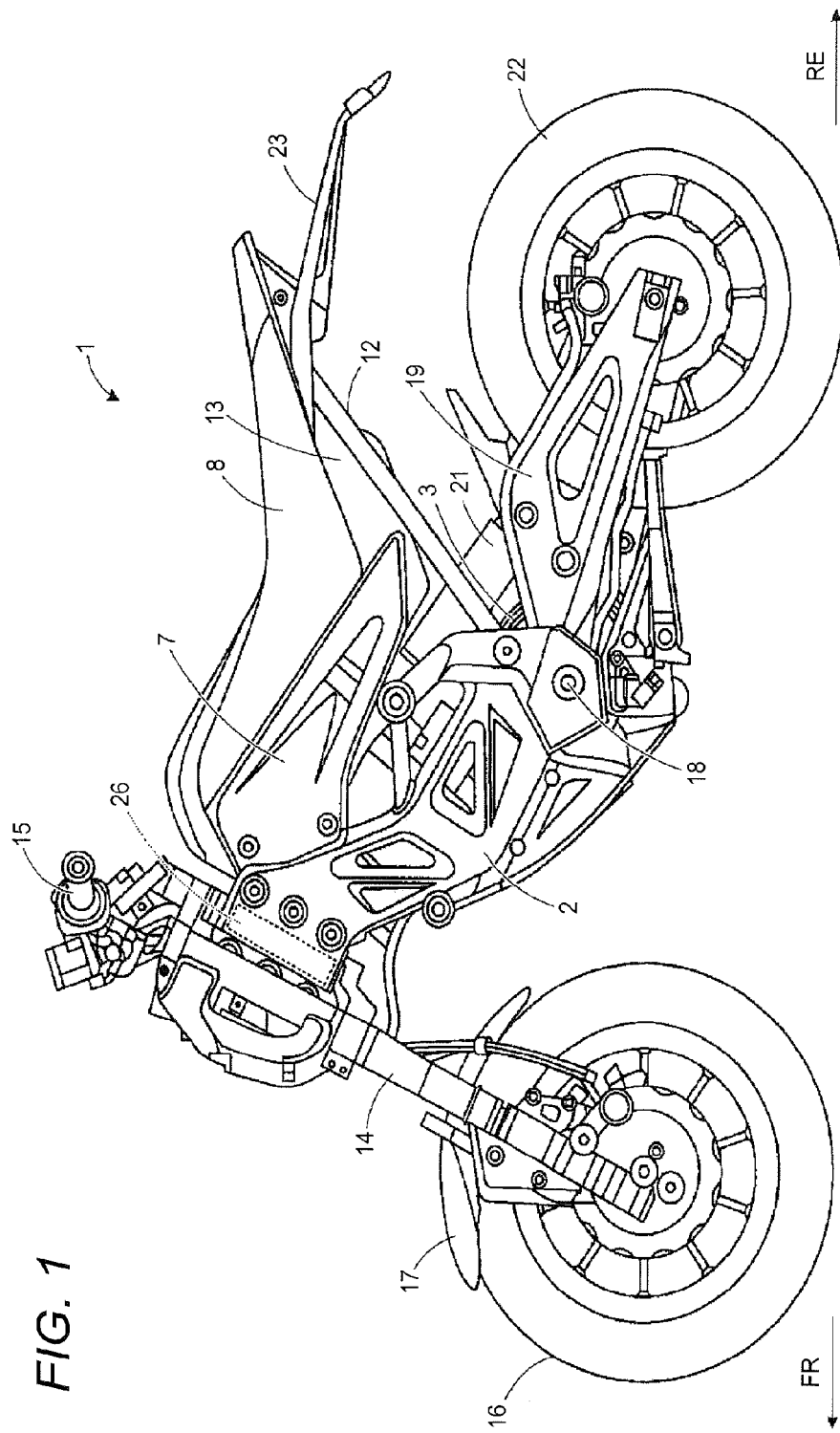
Nov. 5, 2013 (JP) ..... 2013-229491

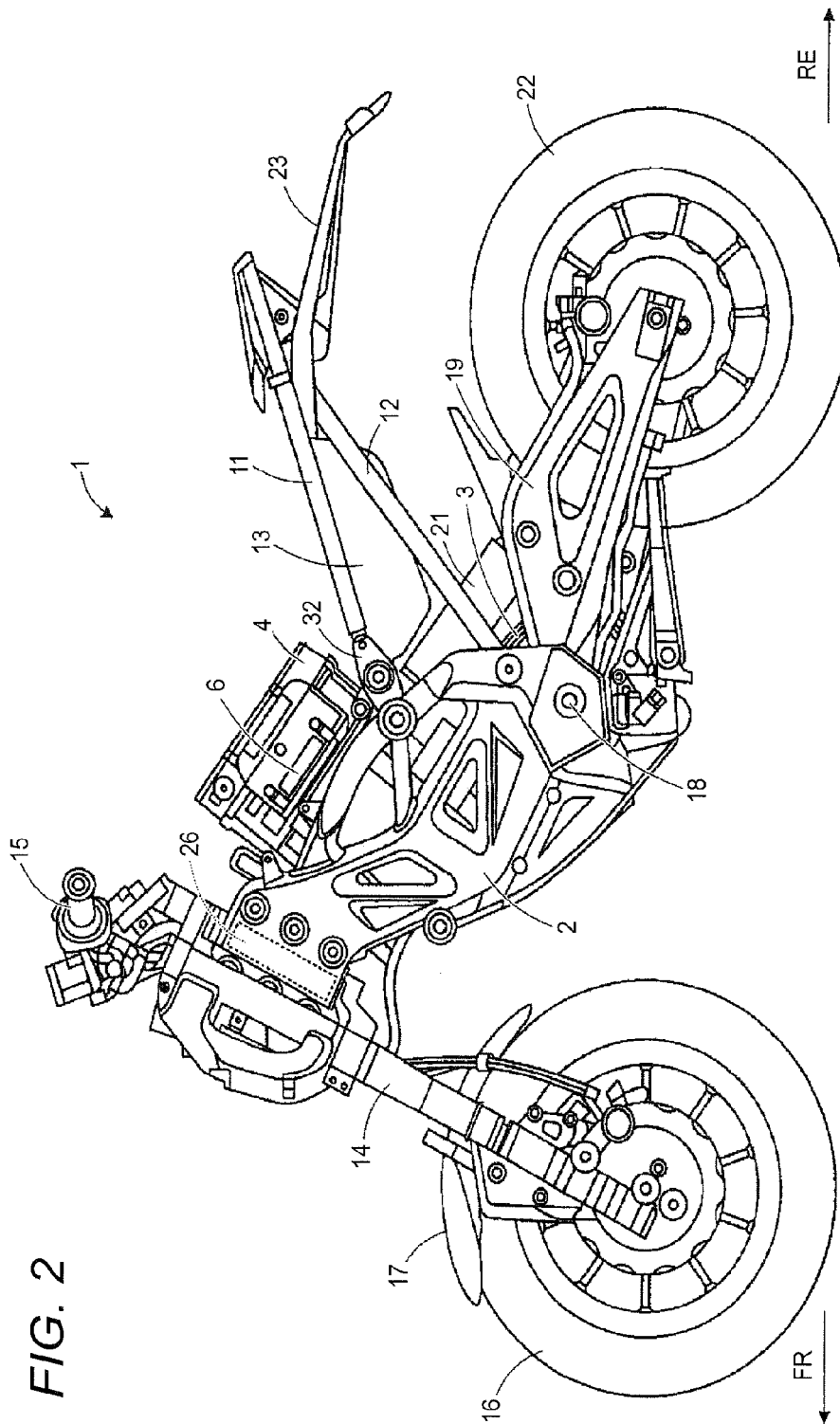
(57)

**ABSTRACT**

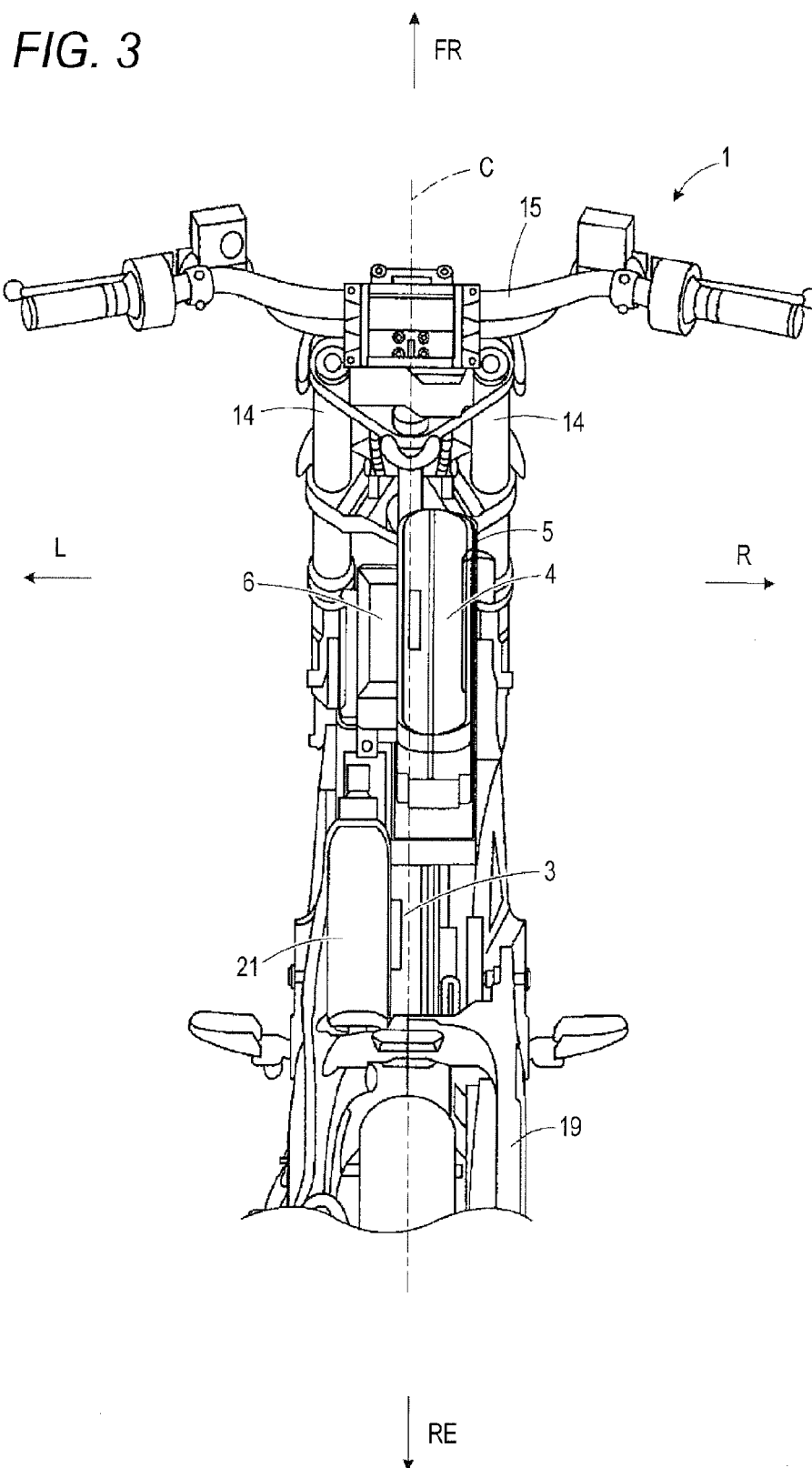
There is provided a frame structure for an electric motorcycle. A plurality of electric components are mounted in a chassis framework comprised of a pair of half-frame bodies. One of the half-frame bodies is formed into a module to which electric components are connected via cables.











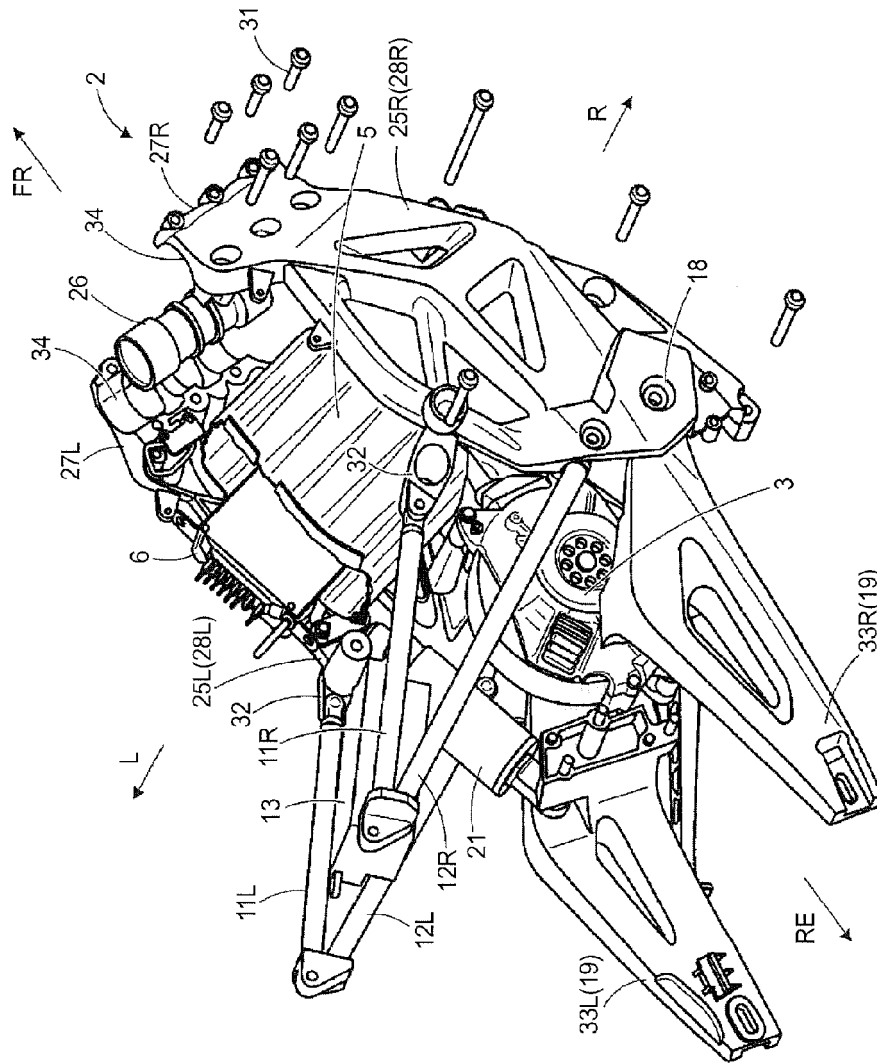
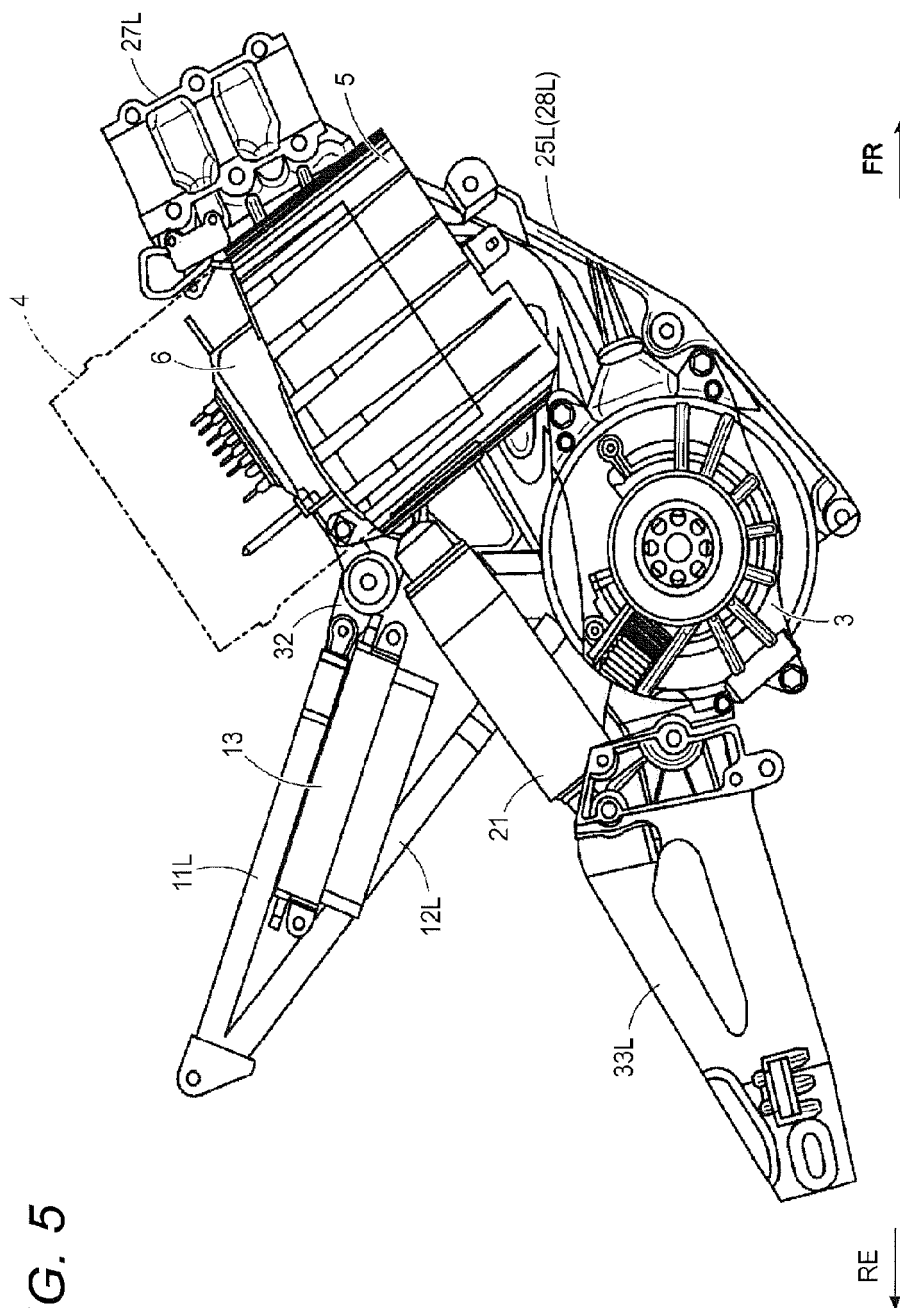
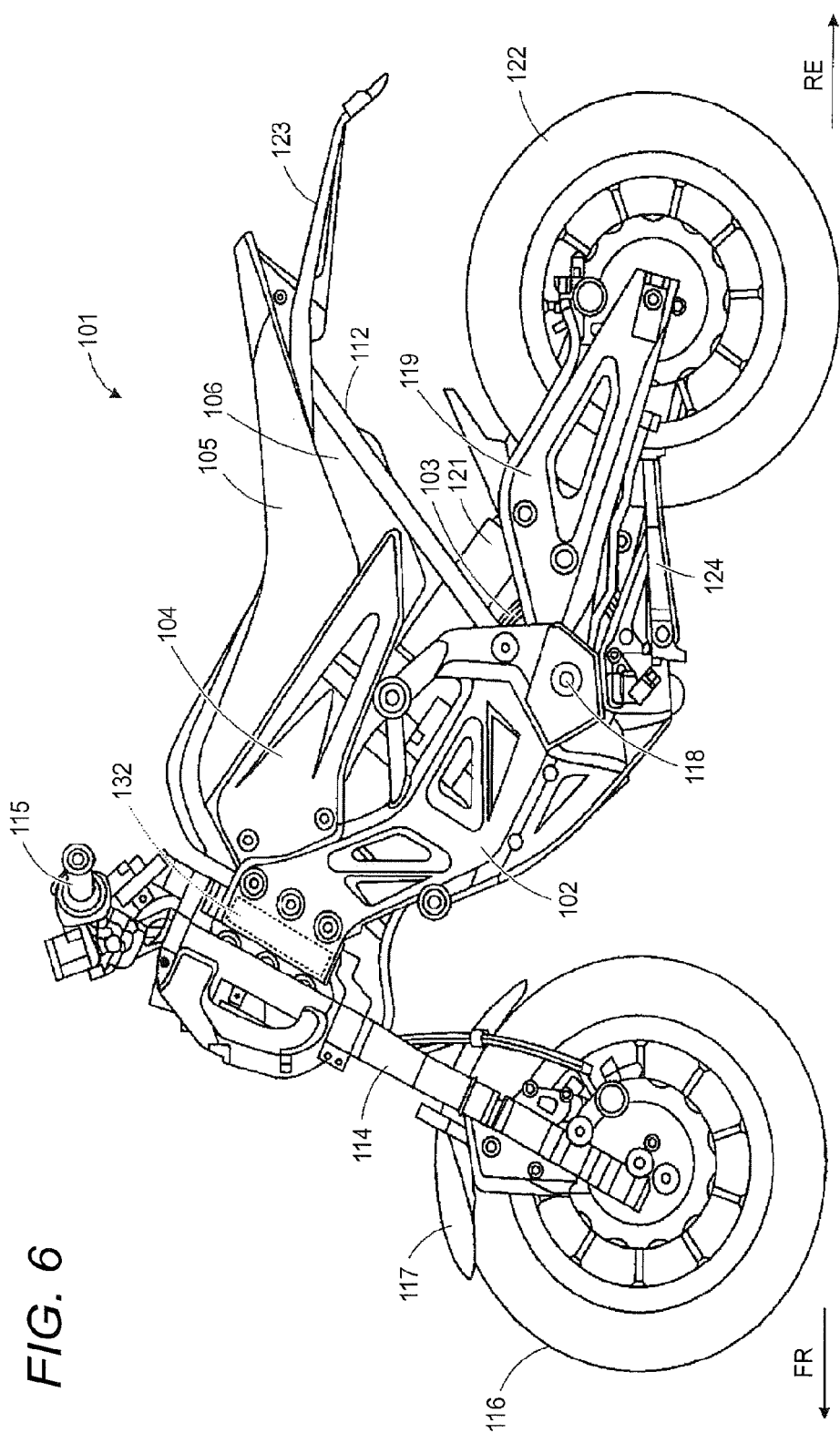


FIG. 4





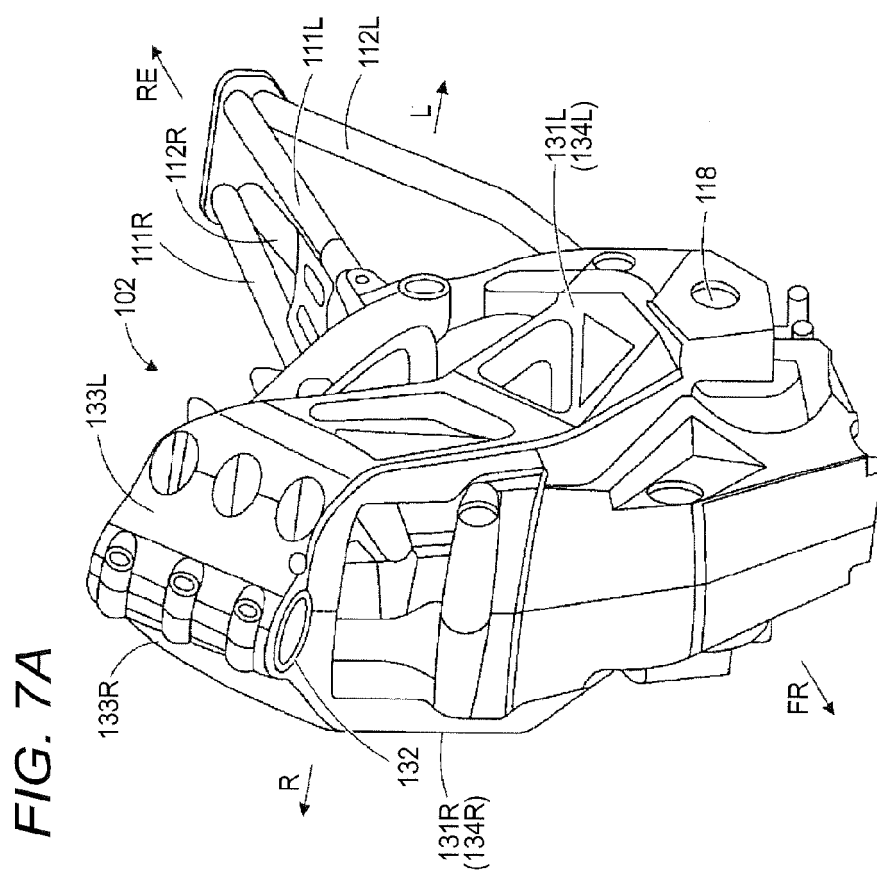
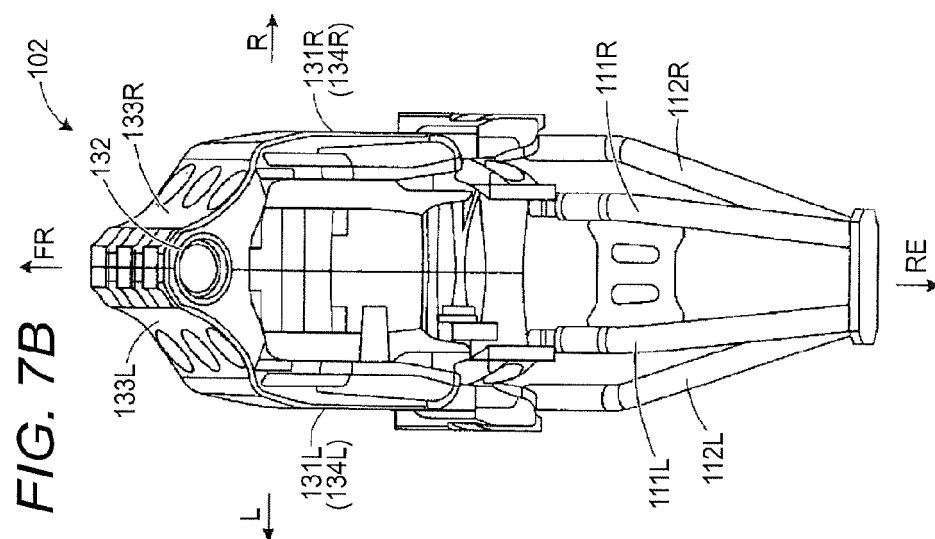


FIG. 8A

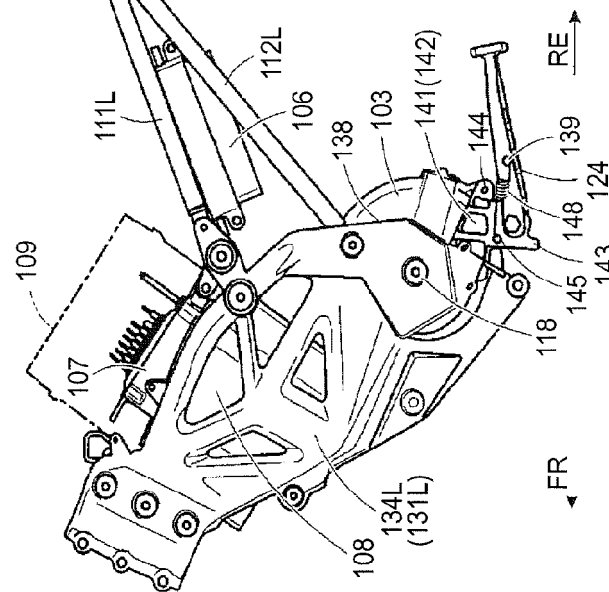


FIG. 8B

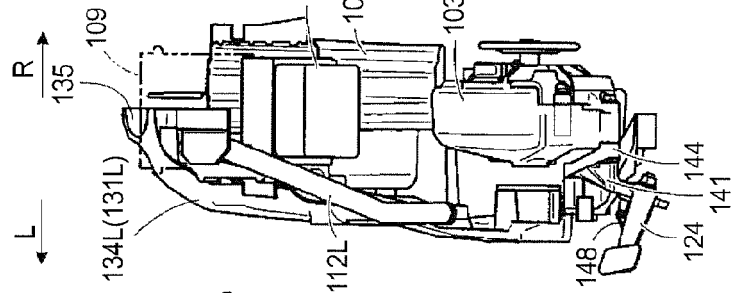


FIG. 8C

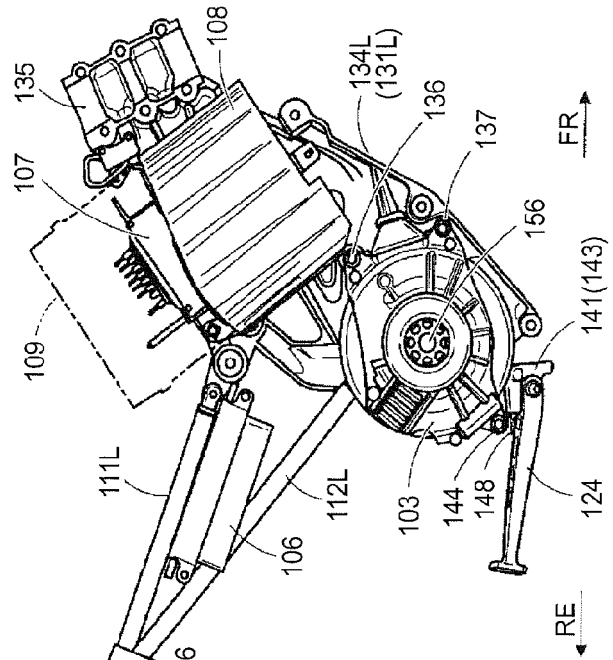


FIG. 9A

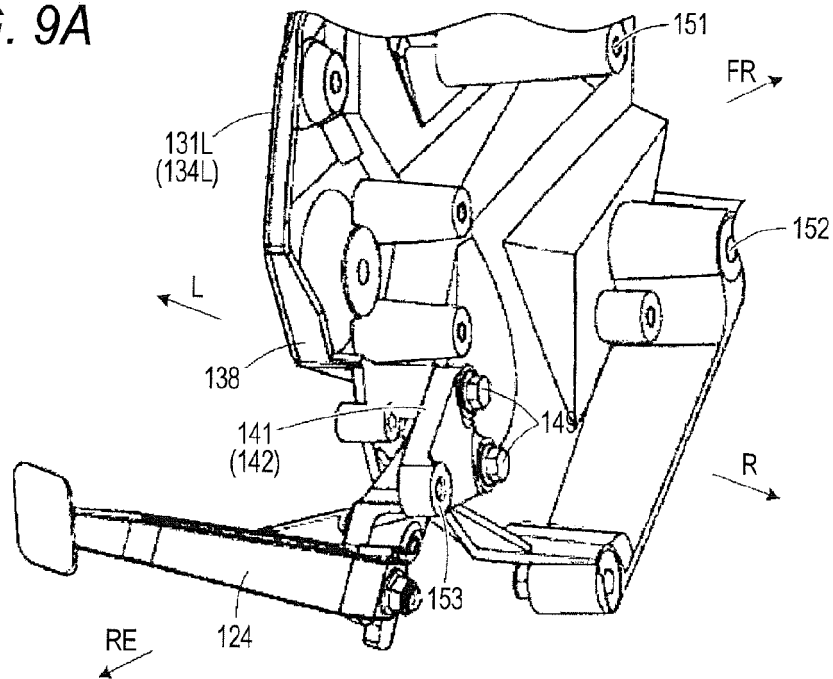


FIG. 9B

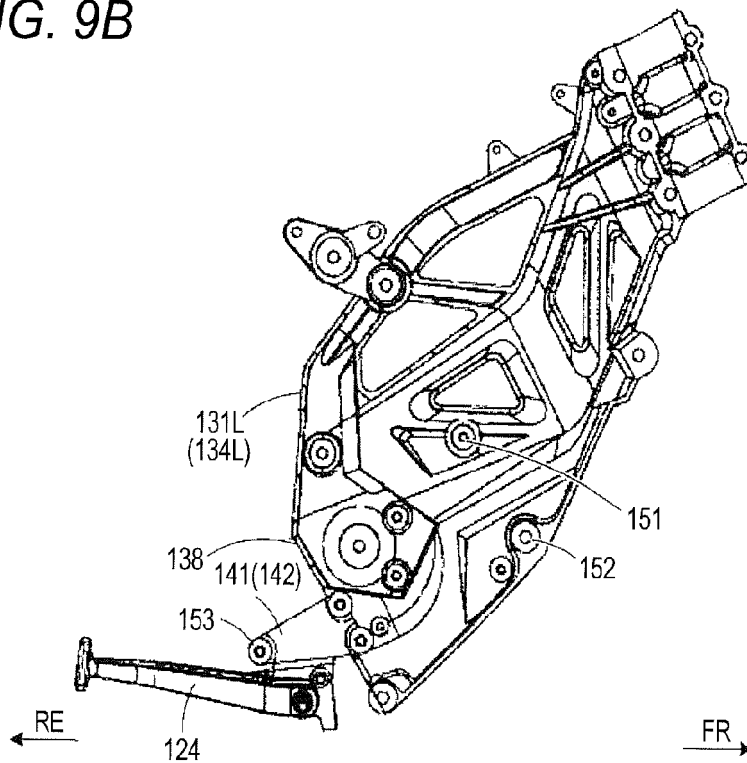


FIG. 10A

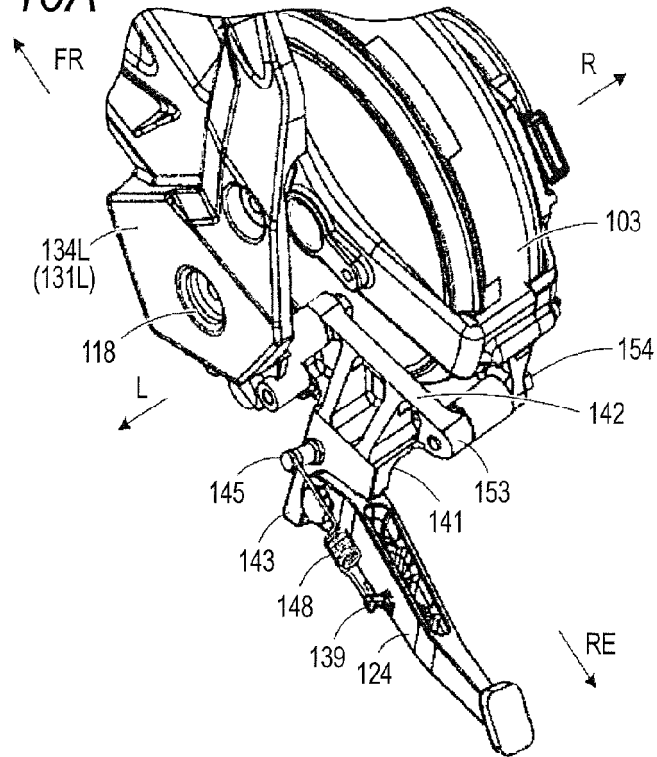
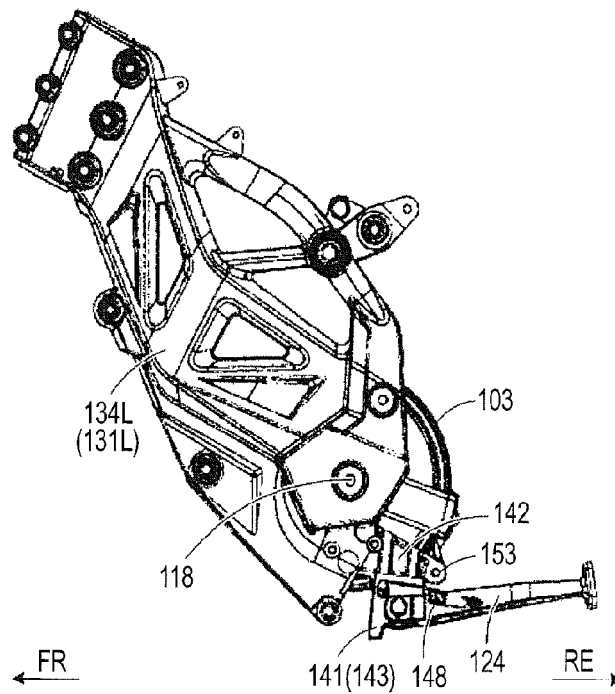


FIG. 10B





US 2015/0122568 A1

May 7, 2015

1

# FRAME STRUCTURE FOR ELECTRIC MOTORCYCLE AND SUPPORT STRUCTURE FOR ELECTRIC MOTOR

**[0001]** The disclosure of Japanese Patent Application No. 2013-229490 filed on Nov. 5, 2013 and Japanese Patent Application No. 2013-229491 filed on Nov. 5, 2013, including specifications, drawings and claims is incorporated herein by reference in its entirety.

## TECHNICAL FIELD

**[0002]** The invention relates, in general, to a frame structure for an electric motorcycle and, more particularly, to a frame structure for an electric motorcycle in which main components are connected together by means of high voltage cables.

**[0003]** The invention relates, in general, to a support structure for an electric motor and, more particularly, to a support structure for supporting an electric motor on a chassis framework made of cast aluminum.

## BACKGROUND

**[0004]** Conventionally, a chassis of an electric motorcycle has been known, which accommodates an electric component, such as a battery, or the like, which requires a relatively-wide mounting space (see Japanese Patent Application Publication No. 2006-219081). The chassis disclosed in Japanese Patent Application Publication No. 2006-219081 is provided with a mounting space defined by left and right half-frame parts and having on the lateral side thereof an opening through which the mounting space is exposed to the outside. Electric components are mounted into the mounting space through the opening in a state of being stored in an expandable accommodating casing. When the electric component is mounted, through the opening on the half-frame part, into the mounting space in a state of being stored in the accommodating casing, which is larger than the opening, it is possible to insert the accommodating casing into the mounting space of the chassis by making the accommodating casing contracted.

**[0005]** Main components, such as an electric motor, an inverter, a controller, and the like, are mounted in the chassis of an electric motorcycle. Since heavy current flows through such components, components are connected together by means of thick high voltage cables, which are, however, uneasy to mount. Further, since the electric motorcycle is provided with a plurality of sensors and switches, and a main harness has a complicated structure, the electrical wirings are complicated. Furthermore, currently-available electric motorcycles are required to be made lighter and smaller, so it is expected that, in the future, the mounting space in the chassis be reduced. Because of this, in the above-mentioned chassis structure in which electric components are to be mounted in a state of left and right half-frame parts being bonded together to form the chassis structure, it is difficult to mount the wirings.

**[0006]** Conventionally, a scooter-type electric motorcycle includes an electric motor on the side of a rear wheel attached to a rear swing arm connected to a chassis framework (see Japanese Patent Application Publication No. 2013-154859). In the electric motorcycle disclosed in Japanese Patent Application Publication No. 2013-154859, a pivot plate is provided onto a chassis framework, and a rear swing arm is connected such that it is vertically movable about a pivot axis of the pivot plate. Further, a side kickstand is attached to the pivot plate

below the pivot axis. When the side kickstand flips down and makes contact with the ground, the electric motorcycle is kept upright for itself. Like this, for the scooter-type electric motorcycle, the attachment position of the side kickstand is separated from the electric motor.

**[0007]** For other type electric motorcycles, however, the electric motor is supported at a position in proximity to a pivot of the chassis framework. In order to allow the electric motor to be supported by the chassis framework, it is required to support an output shaft of the electric motor at three or more points around the output shaft so as to counteract a reaction against a driving force applied to the output shaft. Because of this, a problem arises in that the electric motor cannot be stably supported unless a section is used to support the electric motor throughout a wide lateral side area of the chassis framework.

**[0008]** Further, a bracket for a side kickstand is attached to the chassis framework in proximity to the support position of the electric motor. This bracket is formed from a forged material harder than the chassis framework, since it is subjected to a local load at a position close to a rotary shaft of the side kickstand. Therefore, since the chassis framework should include the attachment position of the bracket for a side kickstand, the chassis framework has a limited area to support the electric motor.

## SUMMARY

**[0009]** It is therefore an object of the present invention to provide a frame structure for an electric motorcycle which is capable of improving the mounting of electric components and the wiring therebetween.

**[0010]** Another object of the present invention to provide a support structure for an electric motor, which is capable of stably supporting the electric motor while securing the attachment position of a bracket for a side kickstand.

**[0011]** In order to solve the problem, the present invention provides a frame structure for an electric motorcycle in which a plurality of electric components are mounted in a chassis framework comprised of a pair of half-frame bodies, wherein one of the half-frame bodies is formed into a module to which electric components are connected via cables.

**[0012]** According to this configuration, since one of the half-frame bodies and the plurality of electric components are formed into a module, when the half-frame bodies in a pair are coupled together, the plurality of electric components can be easily mounted in the chassis framework. Since the electric components and the wiring are mounted onto one of the half-frame bodies before the pair of half-frame bodies is coupled, the wiring between the electric components can be easily conducted. Further, the mounting of the electric components and the wiring can be conducted in a narrowed mounting space in the chassis framework, contributing to the fabrication of a light, small electric motorcycle.

**[0013]** In the frame structure for an electric motorcycle according to the present invention, the plurality of electric components may include an electric motor, an inverter, and a controller. In this configuration, since heavy current flows through the electric motor, the inverter, and the controller, the electric components are connected together by means of thick high voltage cables which are uneasy-to-install. However, since the mounting of the high voltage cables is carried out when the pair of half-frame bodies is in an open state, the wiring can be easily conducted.

US 2015/0122568 A1

May 7, 2015

2

**[0014]** In the frame structure for an electric motorcycle according to the present invention, a seat rail comprised of a pair of rail members and a swing arm comprised of a pair of half-arm bodies are mounted in the chassis framework, wherein one of the half-frame bodies is formed into a module to which one of the rail members, one of the half-arm bodies, and a rear suspension are connected, in addition to the electric components, and the other half-frame body is formed into a module to which the other rail member and the other half-arm body are mounted. According to this configuration, when the pair of modular half-frame bodies is coupled, the seat rail, the swing arm, and the rear suspension can be easily mounted to the chassis framework, in addition to the electric components.

**[0015]** In the frame structure for an electric motorcycle according to the present invention, the pair of half-frame bodies is coupled, with a head pipe interposed therebetween. According to this configuration, since the pair of half-frame bodies and the head pipe are discrete elements, the head pipe is not required to be separately formed onto respective half-frame bodies in a single-piece body. Therefore, there is no need for the head pipe to be machined after the pair of half-frame bodies is coupled as in the case where the pair of half-frame bodies is coupled to form the head pipe.

**[0016]** In the frame structure for an electric motorcycle according to the present invention, one of the half-frame bodies in a pair is formed into a module to which electric components are connected, so that the mounting of the electric components and the wiring between the electric components in the chassis frame can be easily conducted.

**[0017]** According to the present invention, a support structure for an electric motor provided on a chassis framework, wherein a bracket for a side kickstand is attached to the chassis framework, and wherein the electric motor is supported by the chassis framework and the bracket at three or more points around an output shaft of the electric motor.

**[0018]** According to this configuration, the electric motor is supported by the bracket for a side kickstand as well as the chassis framework, so that the electric motor can be supported at three or more points around the output shaft even when the lateral side of the chassis framework is made smaller. Accordingly, the electric motor can be stably supported by the chassis framework and the bracket. Further, since the bracket for a side kickstand as a portion of the chassis framework serves as a support position for the electric motor, the support position for the electric motor in the chassis framework is not limited with the provision of the bracket. Further, since the bracket for a side kickstand serves as the support position for the electric motor, it is not required to separately prepare a support member for the electric motor, thereby reducing the number of parts.

**[0019]** In the support structure for an electric motor, the electric motor and the bracket are bolt-fastened from the inside of the chassis framework. According to this configuration, bolt heads are positioned inside of and covered with the chassis framework and the bracket, thereby improving the appearance.

**[0020]** In the support structure for an electric motor, the electric motor is positioned at a substantially middle portion between a front wheel and a rear wheel, and the side kickstand is rotatably attached to a lower portion of the bracket. According to this configuration, since the side kickstand is positioned at a lower central portion of the motorcycle, maneuverability and stability are improved owing to centralized and lowered mass.

**[0021]** In the support structure for an electric motor, the attachment position of the bracket on the chassis framework is in a projected surface of the electric motor, and is positioned below the center of pivot. According to this configuration, since the bracket is in the projected surface of the electric motor, the support position of the bracket can be located in proximity to the chassis framework. Accordingly, the support position of the bracket for the electric motor comes close to the chassis framework, thereby forming a compact, light chassis framework.

**[0022]** In the support structure for an electric motor, a rear edge of the chassis framework is positioned in proximity to the attachment position of the bracket so that the bracket is exposed to the outside. According to this configuration, the lateral side of the chassis framework is made smaller, contributing to the formation of a compact, light chassis framework.

**[0023]** In the support structure for an electric motor, the chassis framework is formed from a cast material, and the bracket is formed from a forged material. According to this configuration, since a portion of the electric motor is supported by the bracket made of a forged material mechanically harder than the chassis framework made of a cast material, the electric motor can be more stably supported.

**[0024]** In the support structure for an electric motor according to the present invention, the electric motor is supported by the chassis framework and the bracket for a side kickstand, so that the electric motor can be stably supported even when the lateral side of the chassis framework is made smaller.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0025]** In the accompanying drawings:

**[0026]** FIG. 1 is a left side view of an electric motorcycle according to a first embodiment of the present invention;

**[0027]** FIG. 2 is a view of the electric motorcycle of FIG. 1 in which a seat and a side cover are removed;

**[0028]** FIG. 3 is an oblique-top view of the electric motorcycle in which a chassis framework is removed;

**[0029]** FIG. 4 is an exploded perspective view of a modular half-frame body in which a chassis framework is disassembled;

**[0030]** FIG. 5 is a side view showing the medial portion of a left half-frame body;

**[0031]** FIG. 6 is a left side view of an electric motorcycle according to a second embodiment of the present invention;

**[0032]** FIGS. 7A and 7B are views showing a chassis framework;

**[0033]** FIGS. 8A to 8C are views showing the attachment position for an electric motor;

**[0034]** FIGS. 9A and 9B are views showing the attachment position of a bracket; and

**[0035]** FIGS. 10A and 10B are views showing the attachment position for an electric motor.

#### DETAILED DESCRIPTION OF THE EMBODIMENTS

##### First Embodiment

**[0036]** The first embodiment of the present invention will now be described in detail with reference to the accompanying drawings.

**[0037]** Although an example of a frame structure for an electric motorcycle to be adapted to an off-road type electric

US 2015/0122568 A1

May 7, 2015

3

motorcycle will be described hereinbelow, the adaptive object is not limited thereto, but may change. For example, the frame structure may be adapted to other type electric motorcycles. FIG. 1 is a left side view of an electric motorcycle 1 according to the first embodiment of the present invention. FIG. 2 is a view of the electric motorcycle 1 of FIG. 1 in which a seat 8 and a side cover 7 are removed. FIG. 3 is an oblique-top view of the electric motorcycle 1 in which a chassis framework 2 according to the first embodiment of the present invention is removed. In the meantime, arrows FR, RE, L, and R respectively denote a front side, a rear side, a left side, and a right side of a chassis throughout the drawings.

[0038] As shown in FIGS. 1 and 2, the electric motorcycle 1 is provided with a chassis framework 2 made of steel or aluminum alloy to which discrete parts such as a power unit, electric components and the like are mounted. The chassis framework 2 is divided into two sections from a head pipe 26 located at a front end thereof and extends obliquely downward towards the rear side thereof. An electric motor 3 and a battery 4 are attached to the inside of the chassis framework 2. The battery 4 may be e.g. a lithium-ion battery, and is attached to the chassis framework 2, with a lower-half portion thereof stored in a battery box 5 (see FIG. 3). A controller 6 is fixed to the inside of the battery box 5 so as to control the drive of the electric motor 3.

[0039] A side cover 7 is attached to the chassis framework 2 to cover the upper portion of the chassis framework 2 to improve an appearance. A seat 8 is disposed over the side cover 7. A portion of the battery 4 exposed to the outside from the chassis framework 2 is to be covered by the side cover 7 and the seat 8. The seat 8 is supported by a pair of left and right seat rails 11 extending obliquely upwardly in the rearward direction from the rear side of the chassis framework 2. A pair of left and right side frames 12 is attached to the rear side of the chassis framework 2 in order to support the left and right seat rails 11 at lower portions thereof. An inverter 13 is attached to the seat rails 11.

[0040] On the front side of the chassis framework 2, a pair of left and right front forks 14 is attached to the head pipe 26 in a steerable manner by means of a steering shaft (not shown). The front forks 14 are provided with front suspensions for shock-absorption of a front wheel, by which shocks from the front wheel 16 are not transferred to the chassis framework 2. A handle 15 is attached to the upper side of the front forks 14. The front wheel 16 is rotatably supported by the front forks 14 at their lower portions. A front fender 17 is provided over the front wheel 16 to cover it.

[0041] On the rear side of the chassis framework 2, a swing arm 19 is vertically movably connected to a pivot center 18. A rear suspension 21 for shock-absorption of a rear wheel is attached between the chassis framework 2 and the swing arm 19, in order to absorb shock between the chassis framework 2 and the rear wheel 22. The rear wheel 22 is rotatably supported by the swing arm 19 at its rear side, and a rear fender 23 is provided to the rear side of the seat rail 11 so as to cover the upper portion of the rear wheel 22. Power from an output shaft of the electric motor 3 is transmitted to the rear wheel 22 via a chain or the like.

[0042] As shown in FIG. 3, the rear suspension 21 is provided on the left side with respect to the central line C extending in the longitudinal direction of the chassis, and the battery 4 is provided on the right side with respect to the central line C. Further, the electric motor 3 is provided below the rear suspension 21 and the battery 4 along the central line C. Since

the rear suspension 21 and the battery 4, which are heavy-weight components, are proportionally arranged in the widthwise direction, and the electric motor, which is also a heavy-weight component, is arranged at the center in the widthwise direction, a weight of the motorcycle body is substantially balanced in the widthwise direction, thereby improving steering stability.

[0043] Returning again to FIG. 2, in the electric motorcycle 1, the electric motor 3 is power-supplied from the battery 4 via the inverter 13, and the controller 6 controls the drive of the electric motor 3. Since heavy current flow through the main components, such as the inverter 13, the electric motor 3, the controller 6, and the like, the main components are connected together by means of high voltage cables. Since high voltage cables are thick and uneasy-to-bend, it is difficult to mount and wire the main components from the outside of the chassis framework 2. Further, the electric motorcycle 1 is provided with a variety of sensors and switches, the wiring between the controller 6 and the sensors or switches is complicated.

[0044] Accordingly, the first embodiment configures the chassis framework 2 to be comprised of a pair of left and right half-frame bodies 25L and 25R (FIG. 4). In addition, before assembly, the half-frame bodies are formed into modules (sub-assembly) by mounting or wiring components thereto, and then the modular half-frame bodies are assembled together. This leads to easy mounting or wiring of components in the chassis framework 2. The mounting and wiring operations for the chassis framework will now be described with respect to FIGS. 4 and 5.

[0045] FIG. 4 is an exploded perspective view of the chassis framework 2 according to the first embodiment. FIG. 5 is a side view of the left half-frame body 25L according to the first embodiment. Although FIGS. 4 and 5 illustrate that a variety of electric components are mounted to the left half-frame body 25L, the present invention is not limited thereto. The electric components may be mounted to the right half-frame body 25R. Further, in FIG. 5, the battery 4 is indicated by two-dot chain line.

[0046] As shown in FIG. 4, the chassis framework 2 is comprised of a pair of left and right half-frame bodies 25L and 25R, which is to be assembled together. The half-frame bodies 15L, 25R are provided with head frame parts 27L, 27R, which hold the head pipe 26 which is a unitary body, and main frame parts 28L, 28R extending from the head frame parts 27L, 27R toward the middle portion of the electric motorcycle. The head frame parts 27L, 28R are provided with semi-cylindrical recesses 34 that correspond to the external shape of the head pipe 26. The half-frame bodies 25L, 25R and the head pipe 26 are integrally assembled by bolt 31-connecting the head frame parts 27L, 27R together while the head pipe 26 is fitted into the recesses 34.

[0047] The main frame parts 28L, 28R are main elements that form the greater part of the chassis framework 2. When the main frame parts 28L, 28R are assembled together by means of a plurality of bolts 31, a mounting space is formed therein to accommodate a variety of components. The mounting space is closed at the front side in the vertical direction, and is opened at the upper side in the rearward direction. The battery box 5 equipped with the controller 6 is attached to a substantially front half section of the left main frame part 28L. A battery 4 (see FIG. 5) is stored in the battery box with an upper portion thereof exposed to the outside from the battery box. The electric motor 3 is attached to a substantially rear half section of the left main frame part 28L.



US 2015/0122568 A1

May 7, 2015

4

[0048] A bracket 32 is provided on the left main frame part 28L in a protruded manner, and the seat rail 11L is attached to the bracket 32. The seat rail 11L is reinforced, at its lower portion, by the side frame 12L attached to the left main frame part 28L. Further, the swing arm 19 is comprised of a pair of half-arm bodies 33L, 33R, wherein the left half-arm body 33L is connected to the left main frame part 28L in a shakable manner. Further, the left main frame part 28L and the left half-arm body 33L are connected together by the rear suspension 21.

[0049] The left main frame part 28L is formed into a module by attaching the controller 6, the battery box 5, the electric motor 3, the inverter 13, the seat rail 11L, the side frame 12L, the half-arm body 33L, and the rear suspension 21 thereto. In the meantime, the right main frame part 28R is formed into a module by attaching the seat rail 11R, the side frame 12R, and the half-arm body 33R thereto, opposite the configuration of the left main frame part 28L. The chassis framework 2 can therefore be formed by simply assembling the pair of left and right modular half-frame bodies.

[0050] As shown in FIG. 5, the top-opened battery box 5 is mounted to the front-half side of the left main frame part 28L in such a way as to be inclined rearwards. The controller 6 is attached to the left inner side of the battery box 5, and a storing space for a battery 4 is formed on the right side of the controller 6. A harness for various sensors or switches required for the control of the electric motor 3 is connected to the controller 6 via a main harness. The battery 4 is stored in the battery box 5 in proximity to the controller 6, and supplies power to the controller 6.

[0051] The electric motor 3 is mounted to the rear-half side of the left main frame part 28L below the battery box 5. Since the heavy electric motor is attached to the lower portion of the motorcycle body at a substantially middle portion between the front wheel 16 and the rear wheel 22, the center of weight in the motorcycle body is lowered, leading to improved maneuverability and stability. The inverter 13 is mounted to the seat rail 11L extending rearwards from the left main frame part 28L. Like this, to the left main frame part 28L, the controller 6 (battery box 5), the inverter 13, and the electric motor 3 are integrally mounted. Further, the controller 6 (battery box 5), the inverter 13, and the electric motor 3 are connected by means of thick high voltage cables.

[0052] The half-arm body 33L is mounted to the pivot center 18 (see FIG. 4) of the left main frame part 28L. The rear suspension 21 is mounted, at its rear side, to a substantially-middle portion of the half-arm body 33L. The front side of the rear suspension 21 is mounted to the main frame part 28L in proximity to the rear side of the battery box 5. The rear suspension 21 is arranged in a space defined by the battery box 5, the electric motor 3, and the inverter 13, leading to efficient utilization of space in the main frame 28.

[0053] In this case, the mounting and wiring operations performed on the left half-frame body 25L are carried out before the left half-frame body is assembled to the right half-frame body 25R, i.e. when the pair of half-frame bodies 25L, 25R is in an opened state. Therefore, since the mounting or wiring operation can be carried out in a state where the mounting space of the half-frame body 25L (chassis framework 2) is opened towards the outside, the operation position or access to the operation site is not restricted. Therefore, it is possible to easily perform the mounting or wiring of various components on the half-frame body 25L while reducing operation load. Particularly, the controller 6, the electric

motor 3, and the inverter 13 can be easily connected by means of thick, uneasy-to-install high-voltage cables.

[0054] Further, since the mounting or wiring operation can be performed while observing the operation site, operation stability can be improved. Moreover, since the mounting space of the chassis framework 2 can be made smaller as much as the mounting or wiring operation is improved, it is possible to produce a light, small electric motorcycle 1. Further, the chassis framework 2 is formed when the pair of modular half-frame bodies 25L, 25R is assembled together by means of the plurality of bolts 31 (see FIG. 4). Here, since the half-frame bodies 25L, 25R are assembled together while a unitary body of the head pipe 26 is fitted therebetween (see FIG. 4), after the assembly of the pair of half-frame bodies 25L, 25R, it is not required to machine the head pipe 26.

[0055] In the meantime, in the case of a conventional left-right divided chassis framework, a head pipe is formed by machining the front side of the chassis framework while the pair of half-frame bodies is in an assembled state. Because of this, in a state where the respective half-frame bodies are formed into modules, to which various components are mounted, before the assembly of the pair of half-frame bodies, it is difficult to machine the head pipe. Therefore, in the case of the conventional left-right divided chassis framework, after the machining of the head pipe in a state of the pair of half-frame bodies being assembled together, the mounting or wiring operation is carried out. In this case, however, it is difficult to perform the mounting or wiring operation, since the mounting or wiring operation should be performed through the open space of the chassis framework after the assembly of the half-frame bodies.

[0056] On the contrary, according to the first embodiment, with the provision of a unitary body of head pipe 26, the machining of the head pipe 26 after the assembly of the pair of half-frame bodies 25L, 25R is removed. Therefore, although various components are mounted to the respective half-frame bodies 25L, 25R, thereby forming modules, before the assembly of the pair of half-frame bodies 25L, 25R, such measures do not affect subsequent processes any more. Thus, it is possible to perform the mounting or wiring operation before the assembly of the half-frame bodies 25L, 25R, thereby further facilitating the machining process and therefore reducing the manufacturing cost.

[0057] As such, according to the first embodiment, since one of the half-frame bodies 25L, 25R and the plurality of electric components are incorporated into a module, the plurality of electric components can be easily mounted in the chassis framework 2 by assembling the pair of half-frame bodies 25L, 25R together. Here, since the mounting or wiring operation is performed on the left half-frame body 25L before the assembly of half-frame bodies 25L, 25R, the working efficiency can be improved. Further, since the mounting or wiring operation can be conducted while observing the operation site, working stability can be improved. Furthermore, even when the mounting space in the chassis framework 2 is made narrowed, it is possible to carry out the mounting or wiring operation, thereby contributing to the production of a light, small electric motorcycle.

[0058] In the meantime, the present invention may be modified into a variety of forms without being limited to the illustrated embodiments. In the illustrated embodiments, the sizes or shapes of the components are not limited to the sizes or shapes illustrated in the drawings, but may be adequately changed within the scope that the effect of the invention

US 2015/0122568 A1

May 7, 2015

5

affects. In addition, it is possible to adequately modify and implement embodiments without departing from the objective scope of the invention.

[0059] For instance, although the electric motor 3, the inverter 13, the controller 6, and the like are mounted to the left half-frame body 25L according to the first embodiment, the present invention is not limited thereto. It is possible to collectively mount the electric components to one 25 of the pair of half-frame bodies 25L, 25R, or otherwise to mount the electric components to the right half-frame body 25R.

[0060] Further, although the seat rail 11L, the side frame 12L, the half-arm body 33L, and the rear suspension 21 are mounted, as well as the electric components, to the half-frame body 25L so as to form a module according to the first embodiment, the present invention is not limited thereto. It is possible to form a module by mounting only electric components to the half-frame body 25L.

[0061] Further, although the head pipe 26 and the pair of half-frame bodies 25L, 25R are respectively formed as a discrete body according to the first embodiment, the present invention is not limited thereto. The configuration may be such that the machining of the head pipe 26 is not required after the assembly of the pair of half-frame bodies 25L, 25R. For instance, the head pipe 26 may be integrally formed onto any one of the half-frame bodies 25L, 25R in a pair.

[0062] As set forth in the foregoing, the present invention provides the effect of facilitating the mounting or wiring operation of respective components in the chassis framework. Particularly, the present invention is applicable to a frame structure for an electric motorcycle in which main components are connected together by means of high voltage cables.

#### Second Embodiment

[0063] The second embodiment of the present invention will now be described in detail with reference to the accompanying drawings. Although an example of a support structure for an electric motor to be adapted to an off-road type electric motorcycle will be described hereinbelow, the adaptive object is not limited thereto, but may change. For example, the support structure may be adapted to other type electric motorcycles. FIG. 6 is a left side view of an electric motorcycle 100 according to the second embodiment of the present invention. In the meantime, arrows FR, RE, L, and R respectively denote a front side, a rear side, a left side, and a right side of a chassis throughout the drawings.

[0064] As shown in FIG. 6, the electric motorcycle 100 is provided with a chassis framework 102 made of steel or aluminum alloy to which discrete parts such as a power unit, electric components and the like are mounted. The chassis framework 102 is divided into two sections from a head pipe 132 located at a front end thereof and extends obliquely downward towards the rear side thereof. A battery 109 (see FIGS. 8A to 8C) and an electric motor 103 are respectively attached to the front and rear sides in the chassis framework 102. A side cover 104 is attached to the chassis framework 102 to cover the upper portion of the chassis framework 102 to improve an appearance. A seat 105 is disposed over the side cover 104.

[0065] The seat 105 is supported by a pair of left and right seat rails 111 (see FIGS. 7A and 7B) extending obliquely upwardly in the rearward direction from the rear side of the chassis framework 102. A pair of left and right side frames 112 is attached to the rear side of the chassis framework 102 in order to support the left and right seat rails 111 at lower

portions thereof. An inverter 106 is attached to the seat rails 111 in order to convert a DC power from the battery 109 into an AC power. The electric motor 103 is power-supplied from the battery 109 via the inverter 106, and a controller 107 (see FIG. 8C) provided in a battery box 108 (see FIGS. 8A to 8C) controls the drive of the electric motor 103.

[0066] On the front side of the chassis framework 102, a pair of left and right front forks 114 is attached to the head pipe 132 in a steerable manner by means of a steering shaft (not shown). The front forks 114 are provided with front suspensions for shock-absorption of a front wheel, by which shocks from the front wheel 116 are not transferred to the chassis framework 102. A handle 115 is attached to the upper side of the front forks 114. The front wheel 116 is rotatably supported by the front forks 114 at their lower portions. A front fender 117 is provided over the front wheel 116 to cover it.

[0067] On the rear side of the chassis framework 102, a swing arm 119 is vertically movably connected to a pivot center 118. A rear suspension 121 for shock-absorption of a rear wheel is attached between the chassis framework 102 and the swing arm 119, in order to absorb shock between the chassis framework 102 and the rear wheel 122. The rear wheel 122 is rotatably supported by the swing arm 119 at its rear side, and a rear fender 123 provided on the rear side of the seat 105 covers the upper portion of the rear wheel 122. Power from an output shaft of the electric motor 103 is transmitted to the rear wheel 122 via a chain or the like.

[0068] The chassis framework 102 is provided, below the pivot center 118, with a side kickstand 124 which serves to keep the electric motorcycle 101 upright for itself. Since a rotary axis of the side kickstand 124 is applied with a local load, the side kickstand 124 is attached to the chassis framework 102 via a dedicated bracket 141 (see FIGS. 8A to 8C) made of high-strength cast iron or forged aluminum. The electric motor 103 is attached to the chassis framework 102 in proximity to the side kickstand 124. In this case, it is required for the chassis framework 102 to support the output shaft of the electric motor 103 at three or more points around the output shaft. However, if the lateral side of the chassis framework 102 has a small size, it is difficult to secure the support position for the electric motor.

[0069] Accordingly, the second embodiment provides a configuration in which in addition to the chassis framework 102, the bracket 141 for a side kickstand 124 (see FIGS. 8A to 8C) is provided with a support section for the electric motor 103, thereby supporting the electric motor 103 at three or more points. Therefore, even when the lateral side of the chassis framework 102 is made smaller, it is possible to stably support the circumference of the electric motor 103 at three or more points. Hereinbelow, the attachment position of the electric motor 103 will be described with reference to FIGS. 7A, 7B, 8A, 8B and 8C.

[0070] FIGS. 7A and 7B are views showing the chassis framework 102 according to the second embodiment of the present invention. FIGS. 8A to 8C are views showing the attachment position for the electric motor 103 according to the second embodiment of the present invention. In the meantime, FIG. 7A is a perspective view of the chassis framework 102, and FIG. 7B is a top view of the chassis framework 102. Further, FIG. 8A is a left side view of the attachment position for the electric motor 103, FIG. 8B is a rear view of the attachment position for the electric motor 103, and FIG. 8C is a right side view of the attachment position for the electric

US 2015/0122568 A1

May 7, 2015

6

motor 103. Although FIGS. 8A to 8C illustrate that the electric motor 103 is attached to a left half-frame body 131L, the present invention is not limited thereto. If the side kickstand 124 is provided on the right side of an electric motorcycle, the electric motor 103 may be attached to a right half-frame body 131R. Further, in FIGS. 8A to 8C, the battery 109 is indicated by two-dot chain line.

[0071] As shown in FIGS. 7A and 7B, the chassis framework 102 are comprised of a pair of left and right half-frame bodies 131L and 131R, which is to be assembled together. The half-frame bodies 131L, 131R are provided with head frame parts 133L, 133R, which hold the head pipe 132 which is a unitary body, and main frame parts 134L, 134R extending from the head frame parts 133L, 133R towards the rear side of the electric motorcycle. The head frame parts 133L, 133R are provided with semi-cylindrical recesses 135 (see FIG. 8C) that correspond to the external shape of the head pipe 132. The half-frame bodies 131L, 131R and the head pipe 132 are integrally assembled by bolt-connecting the head frame parts 133L, 133R together while the head pipe 132 is fitted into the recesses 135.

[0072] The main frame parts 134L, 134R are main elements that form the greater part of the chassis framework 102. When the main frame parts 134L, 134R are assembled together by means of a plurality of bolts, a mounting space is formed therein to accommodate a variety of components. The mounting space is closed at the front side in the vertical direction, and is opened at the upper side in the rearward direction. The seat rails 111L, 111R are attached to the upper sides of the main frame parts 134L, 134R. The seat rails 111L, 111R are reinforced, at their lower portions, by the side frames 112L, 112R attached to the main frame parts 134L, 134R. Further, the periphery of the pivot center 118 of the main frame parts 134L, 134R forms a mounting space for an electric motor 3 (see FIG. 8A).

[0073] As shown in FIG. 8A to 8C, a top-opened battery box 108 is mounted to the front-half side of the left main frame part 134L in such a way as to be inclined rearwards. The controller 107 is attached to the left inner side of the battery box 108, and a storing space for a battery 109 is formed on the right side of the controller 107. The battery 109 is stored in the battery box 108 in proximity to the controller 107, and supplies power to the controller 107. The inverter 106 is attached to the seat rail 111L extending rearwards from the left main frame part 134L.

[0074] The electric motor 103 is mounted to the rear-half side of the left main frame part 134L below the battery box 108. Since the heavy electric motor 103 is attached to the lower portion of the motorcycle body at a substantially middle portion between the front wheel 116 and the rear wheel 122 (see FIG. 6), the center of weight in the motorcycle body is lowered, leading to improved maneuverability and stability. Like this, to the left half-frame part 131L, electric components including the controller 107 (battery box 108), the inverter 106, and the electric motor 103 are integrally mounted, thereby forming a module. The chassis framework 102 can therefore be formed by simply assembling the right half-frame body 131R onto the left modular half-frame body 131L.

[0075] The substantially rear-half side of the electric motor 103 is exposed to the outside in the proximity of the pivot center 118 of the left main frame part 134L. Because of this, the electric motor 103 is supported by the main frame part 134L at two support positions 136, 137 around the substan-

tially front-half side of the electric motor. The bracket 141 for a side kickstand 124 is attached below the pivot center 118 of the main frame part 134L. A rear edge 138 of the main frame part 134L is located in proximity to the attachment position (see FIGS. 9A and 9B) of the bracket 141 so that the bracket 141 is exposed to the outside from the main frame part 134L.

[0076] The bracket 141 extends rearwards on the projected surface (profile) of the electric motor 103, and supports the substantially rear-half side of the electric motor 103 at one support position 144 on the leading end thereof. The support position 144 of the bracket 141 is located opposite the two support positions 136 and 137 of the main frame part 134L, with the output shaft 156 of the electric motor 103 disposed therebetween. That is, the electric motor 103 is point-supported by the main frame part 134L (chassis framework 102) and the bracket 141 at the three support positions 136, 137, and 144 around the output shaft 156. Like this, the rear-half side of the electric motor 103 is supported by the bracket extending from the rear edge 138 of the chassis framework 102.

[0077] Since the mechanical strength of the bracket 141 is higher than that of the main frame part 134L, even when the width of an arm part 142 extending rearwards from the main frame part 134L is made narrower in the vertical direction, it is possible for the bracket to stably support the electric motor against the chassis framework 102. Further, the side kickstand 124 is rotatably attached to a lower plate 143 on the middle section of the arm part 142 of the bracket 141. A coil spring 148 is connected between respective hooks 139 and 145 of the side kickstand 124 and the plate 143. The side kickstand 124 is returned to its initial position from the ground by means of an elastic force of the coil spring 148.

[0078] The bracket 141 is fixed to the main frame part 134L and the electric motor 103 at its base end and leading end, respectively, of the arm part 142. Therefore, the arm part 142 of the bracket 141 is oppositely supported by the main frame part 134L and the electric motor 103, so that the side kickstand 124 can be stably supported by the plate 143.

[0079] The attachment positions of the bracket 141 and the electric motor 103 for the chassis framework 102 will be described with reference to FIGS. 9A, 9B, 10A and 10B. FIGS. 9A and 9B are views showing the attachment position of the bracket 141 according to the second embodiment. FIGS. 10A and 10B are views showing the attachment position of the electric motor 103 according to the second embodiment. In the meantime, FIGS. 9A and 10A are perspective views showing the periphery of the bracket, and FIGS. 9B and 10B are side views showing the entire chassis framework.

[0080] As shown in FIGS. 9A and 9B, the side kickstand 124 is first attached to the main frame part 134L of the left half-frame body 131L via the bracket 141. The bracket 141 is fastened to the periphery of the rear edge 138 of the main frame part 134L by means of bolts 149 at two positions on the base end of the arm part 142. Since the bracket is fastened by the bolts from the inside of the main frame part 134L, bolt heads are located inside of and covered with the main frame part 134L, improving the appearance of the motorcycle. The bracket 141 is supported by the main frame part 134L in a cantilever manner, and extends rearwards from the rear edge 138 of the main frame part 134L.

[0081] The main frame part 134L is provided, on the inner surface thereof, with support parts 151 and 152, which are spaced apart in the vertical direction so as to support the front side, rather than the output shaft, of the electric motor 103



US 2015/0122568 A1

May 7, 2015

7

(see FIGS. 10A and 10B). Further, the bracket 141 is provided, on the leading end of the arm part 142, with another support part 153 which supports the rear side, rather than the output shaft, of the electric motor 103. The bracket 141 is fastened to the main frame part 134L as such, so that total three support parts 151, 152, and 153 are provided at the two sites on the main frame part 134L and one site on the bracket 141.

[0082] Next, as shown in FIGS. 10A and 10B, the electric motor 103 is attached to the support parts 151, 152, and 153 on the main frame part 134L and the bracket 141 (see FIGS. 9A and 9B). The front side of the electric motor 103 is attached to the support parts 151 and 152 of the main frame part 134L, and the rear side of the electric motor 103 is attached to the support part 153 of the bracket 141. Since the electric motor 103 is fastened to the main frame part 134L and the bracket 141 by means of bolts 154 (only one bolt is shown) from the inside thereof, bolt heads are located inside of and covered with the main frame part 134L and the bracket 141, thereby improving the appearance.

[0083] Like this, the electric motor 103 is supported by the main frame part 134L and the bracket 141 at three points around the output shaft of the electric motor. Because of this, a reaction against the driving force applied to the output shaft of electric motor is counteracted, thereby stably supporting the electric motor 103. Further, since the arm part 142 of the bracket 141 is positioned in the projected surface of the electric motor 103, the support part 153 of the bracket 141 is positioned in proximity to the main body of the electric motor 103. Therefore, a configuration is embodied such that the support part 153 of the bracket 141 is positioned close to the main frame part 134L, thereby forming a compact, light chassis framework. In this case, since the plate 143 of the bracket 141 extends downwards from the projected surface of the electric motor 103, being exposed to the outside, the side kickstand 124 is out of the coverage of the electric motor 103. Further, since the bracket 141 and the side kickstand 124 are located below the pivot center 118 at the middle portion of the motorcycle, centralized and lowered mass can be obtained.

[0084] Since the electric motor 103 is attached to the leading end of the arm part 142 on the bracket 141, the arm part 142 is supported by the main frame part 134L and the electric motor 103 in a cantilever manner. Therefore, the side kickstand 124 is stably supported by the main frame part 134L via the bracket 141. Further, the electric motor 103 is attached to the main frame part 134L with the substantially rear-half side thereof exposed to the outside. Because of this, the lateral side of the main frame part 134L (chassis framework 102) is made smaller, thereby contributing to the formation of a compact, light chassis framework 102. Furthermore, a mold for casting the chassis framework 102 is also made smaller, thereby saving on the cost.

[0085] According to the present invention, the electric motor 103 is supported by the bracket 141 for a side kickstand 124 as well as the chassis framework 102, so that the electric motor 103 can be supported at three or more points around the output shaft of the electric motor 103 even when the lateral side of the chassis framework 102 is made smaller. Accordingly, the electric motor 103 can be stably supported by the chassis framework 102 and the bracket 141. Further, since the bracket 141 for a side kickstand 124 as a portion of the chassis framework 102 serves as a support position for the electric motor 103, the support position for the electric motor 103 in the chassis framework 102 is not limited with the provision of

the bracket 141. Further, since the bracket 141 for a side kickstand 124 serves as the support position for the electric motor 103, it is not required to separately prepare a support member for the electric motor 103, thereby reducing the number of parts.

[0086] In the meantime, the present invention may be modified into a variety of forms without being limited to the illustrated embodiments. In the illustrated embodiments, the sizes or shapes of the components are not limited to the sizes or shapes illustrated in the drawings, but may be adequately changed within the scope that the effect of the invention affects. In addition, it is possible to adequately modify and implement embodiments without departing from the objective scope of the invention.

[0087] For instance, although the electric motor 103 is supported by the chassis framework 102 and the bracket 141 for a side kickstand 124 at three or more points according to the second embodiment, the present invention is not limited thereto. The electric motor 103 may be supported by the chassis framework 102 and the side kickstand 124 at three or more points, e.g. four points.

[0088] Further, although the electric motor 103 and the bracket 141 are bolt-fastened to the chassis framework 102 from the inside of the chassis framework according to the second embodiment, the present invention is not limited thereto. The electric motor 103 and the bracket 141 may be bolt-fastened to the chassis framework 102 from the outside of the chassis framework.

[0089] Further, although the electric motor 103 is bolt-fastened to the chassis framework 102 and the bracket 141 according to the second embodiment, the present invention is not limited thereto. The electric motor 103 may be fastened to the chassis framework 102 and the side kickstand 124 by means of any method, e.g. welding or pressure-fitting.

[0090] Further, although the chassis framework 102 is formed from cast aluminum and the bracket 141 is formed from forged iron or aluminum according to the second embodiment, the present invention is not limited thereto. The chassis framework 102 and the bracket 141 may be formed of a same material. For example, the chassis framework 102 and the bracket 141 may be formed from cast aluminum.

[0091] Further, although the electric motor 103 is supported by a left/right divided chassis framework 102 and the bracket 141 according to the second embodiment, the present invention is not limited thereto. The electric motor 103 may be supported by a left/right integrated chassis framework 102 and the bracket 141.

[0092] As set forth in the foregoing, the support structure of the present invention provides the effect of stably supporting an electric motor while securing the attachment position of a bracket for a side kickstand on a chassis framework, and is particularly useful to support an electric motor on a chassis framework made of cast aluminum.

What is claimed is:

1. A frame structure for an electric motorcycle in which a plurality of electric components are mounted in a chassis framework comprised of a pair of half-frame bodies, wherein one of the half-frame bodies is formed into a module to which electric components are connected via cables.

2. The frame structure for an electric motorcycle according to claim 1, wherein the plurality of electric components comprises an electric motor, an inverter, and a controller.

3. The frame structure for an electric motorcycle according to claim 1,

US 2015/0122568 A1

May 7, 2015

8

wherein a seat rail comprised of a pair of rail members and a swing arm comprised of a pair of half-arm bodies are mounted in the chassis framework,

wherein the one of the half-frame bodies is formed into the module to which one of the rail members, one of the half-arm bodies, and a rear suspension are connected, in addition to the electric components, and

wherein the other half-frame body is formed into a module to which the other rail member and the other half-arm body are mounted.

4. The frame structure for an electric motorcycle according to claim 1, wherein the pair of half-frame bodies is coupled, with a head pipe interposed therebetween.

5. A support structure for an electric motor provided on a chassis framework,

wherein a bracket for a side kickstand is attached to the chassis framework, and

wherein the electric motor is supported by the chassis framework and the bracket at three or more points around an output shaft of the electric motor.

6. The support structure for an electric motor according to claim 5, wherein the electric motor and the bracket are bolt-fastened from the inside of the chassis framework.

7. The support structure for an electric motor according to claim 5, wherein the electric motor is positioned at a substantially middle portion between a front wheel and a rear wheel, and the side kickstand is rotatably attached to a lower portion of the bracket.

8. The support structure for an electric motor according to claim 5, wherein the attachment position of the bracket on the chassis framework is in a projected surface of the electric motor, and is positioned below the center of pivot.

9. The support structure for an electric motor according to claim 8, wherein a rear edge of the chassis framework is positioned in proximity to the attachment position of the bracket so that the bracket is exposed to the outside.

10. The support structure for an electric motor according to claim 5, wherein the chassis framework is formed from a cast material, and the bracket is formed from a forged material.

\* \* \* \* \*



# **EXHIBIT D**



designboom®

technology ▾

video

participate ▾

product library

shop

socialize ▾



## AUDI e bike wörthersee

technology

+9K shares

connections: +440



the AUDI e-bike wörthersee

at the in austria, unveiled its 'wörthersee' performance electric bike for sports and trick cycling, designed incorporating technology from AUDI cars, with testing and feedback from competitive cyclist julien dupont. the bicycle also offers smartphone connectivity for the recording of stunts, and optional automatic stabilization when performing wheelies and other tricks.

completely designed and manufactured at AUDI, the 'wörthersee' offers the highest output of any production electric model at 2.3kW (a power-to-weight ratio of 9kg (19.8lb) per kilowatt). riders can use one of five travel programs, including the human-powered only 'pure' mode; 'pedelec' mixed-use, with a top speed of 50 mph (80 km/hr) and range of 31-44 miles (50 - 70 km) per charge; or 'eGrip' electric-only mode, with a top speed of 31mph (50km/hr). the e-bike's nine-speed, hydraulically actuated gear shift is modeled after the quick response of the R-tronic transmission of AUDI R8s.

the lithium-ion battery pack of the 'wörthersee' is easily removable, charging completely in 2.5 hours.

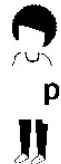
continue reading for more about the production model of the e-bike, or see the concept sketches, early renders, and design notes at designboom's exclusive feature, [here](#).

Marble  
lock  
porcelain  
slabs

FLOORIM

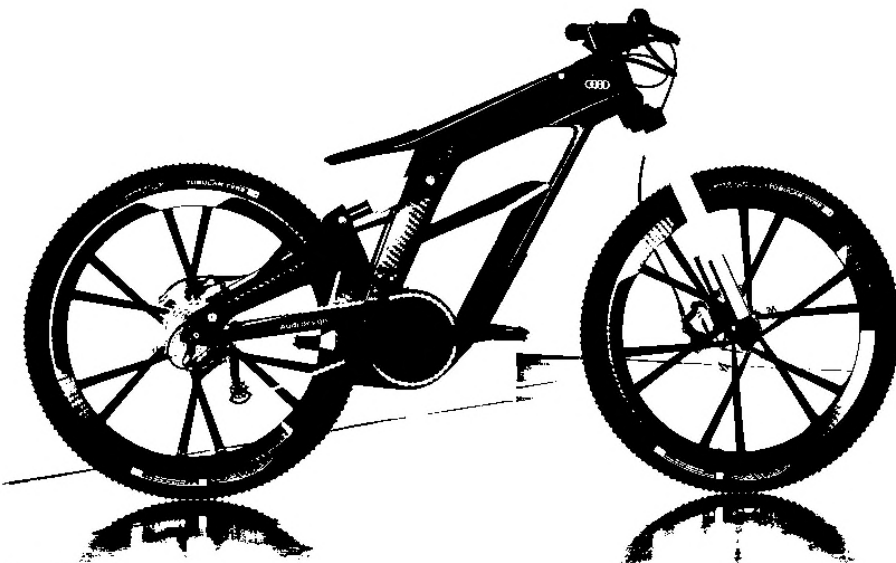


publish my work



profile

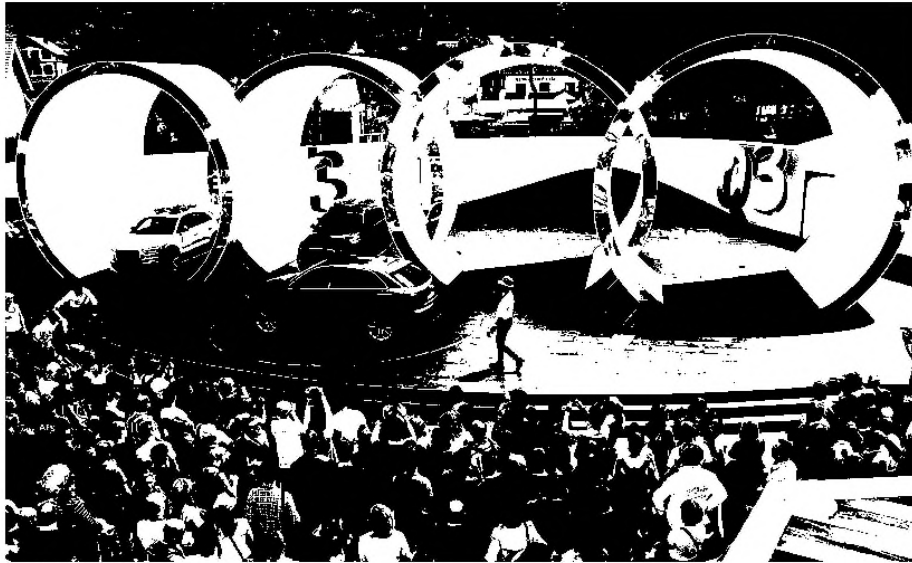
keep up with our daily and  
weekly stories



the frame of the bike is composed of lightweight carbon-fiber-reinforced polymer (CFRP) and weighs 3.53 pounds (1.6 kg); the wheels feature 2-inch CFRP rims and blade-pattern spokes, the flat design of which increase the transmission of pedal power. including the battery and motor, the bike weighs 46.3 pounds (21 kg). LED lighting is integrated into the handlebar and seat. the seat's height can be adjusted through controls on the handlebar; for example, for trick cycling, the bike's seat can be lowered to run flush with the frame, returnable to normal riding position with the touch of a button. a multimode electronic control system also supports the rider when performing backwheeling, wheelies, and other tricks.

julien dupont demos the production version of the AUDI e-bike wörthersee

an on-bike touchscreen computer interfaces with smartphone via WLAN, and video can be recorded via the in-helmet camera and uploaded via the mobile device to the web. an online portal lets trick cyclists compete against one another, earning points for successful tricks that have been videotaped and uploaded.



the AUDI pavilion at the wörthersee tour where the e-bike was debuted



trick cyclist julien dupont performs tricks with the 'wörthersee' on the rings of the AUDI logo at the wörthersee pavilion



#### POPULAR NOW TECH!

vaonis turns your phone into a smart telescope for observation and  
18k views

artificial nests on wind farm provide home to endangered birds & produce electricity at  
18k views

eccentrica's restomod lamborghini diablo hypercar in 3D-printed titanium oozes retro  
13k views

electric jet ski with 18 wheels surfs over water, land, & rocks as all-terrain centipede  
12k views

WAU cyberpunk electric dirt and road bike gets hexagon aluminum body with  
11k views

#### PRODUCT LIBRARY



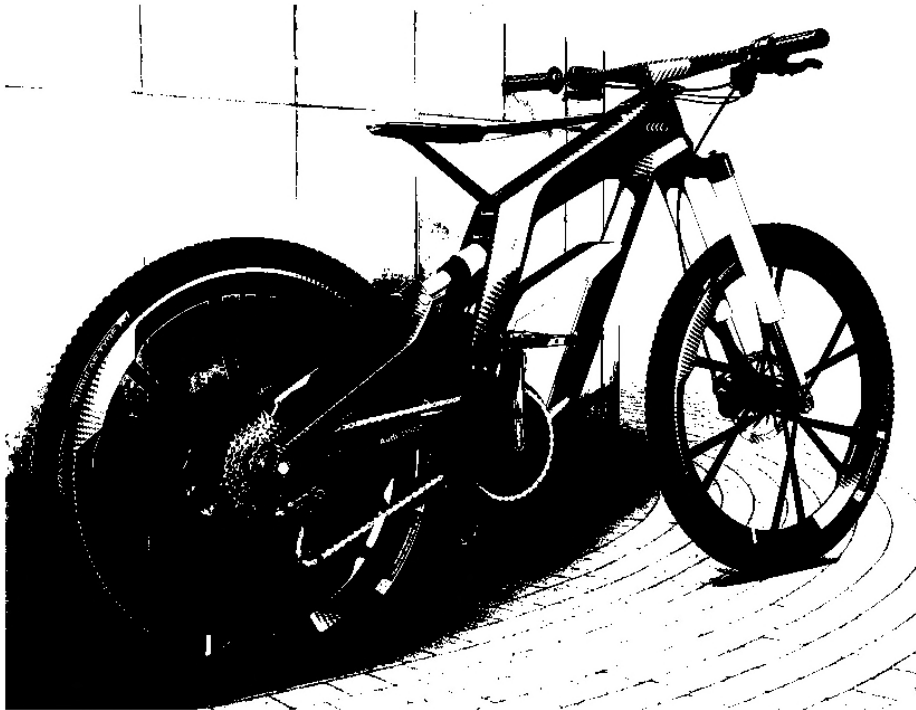


in alliance with ARCHITONIC



LEARN MORE

via smartphone app or handlebar control, the bike can be set to automatically stabilize for the performing of wheelies and other tricks



additional view





3/4 rear view

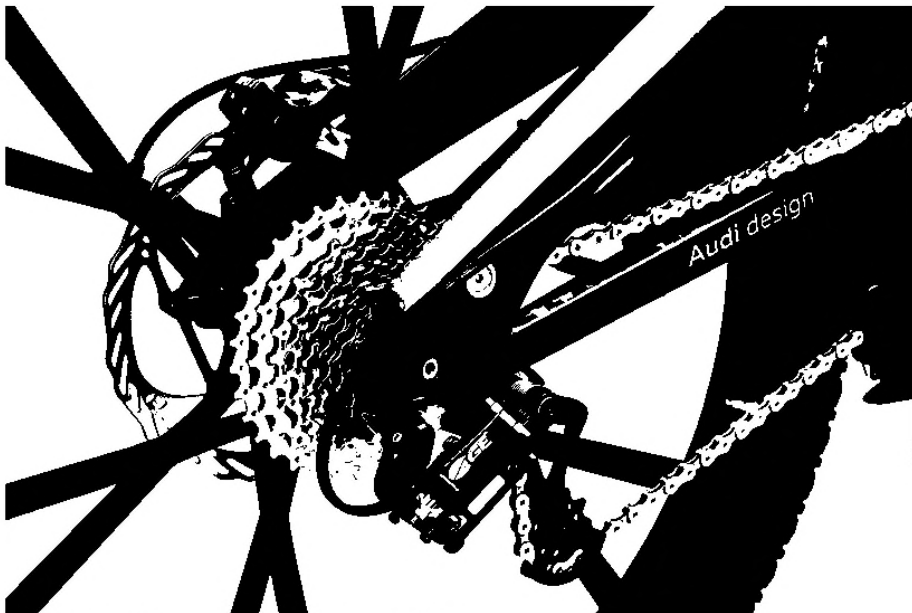


3/4 top view



detail, handlebar controls





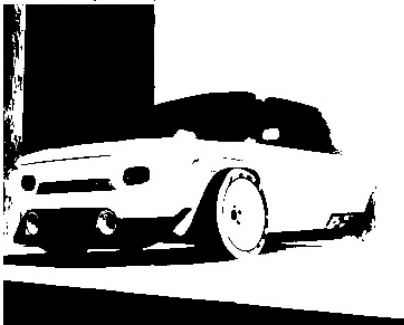
detail, nine-speed hydraulically actuated gear shift of the bike

take a behind-the-scenes look at the design of the bike in designboom's exclusive preview '

jenny filippetti | designboom

may 23, 2012

## AUDI (136)



AUDI restores 1971 NSU prinz 4L into fully electric car 'EP4' styled as modern buggy



AUDI and andrés reisinger blend physical and digital worlds at design miami/ 2022

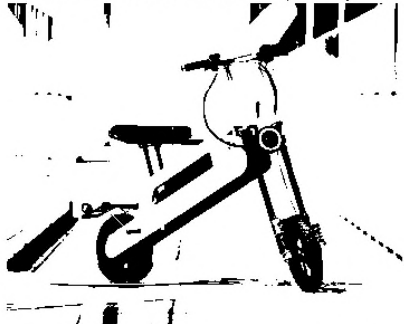


miami art week 2022: your definitive guide

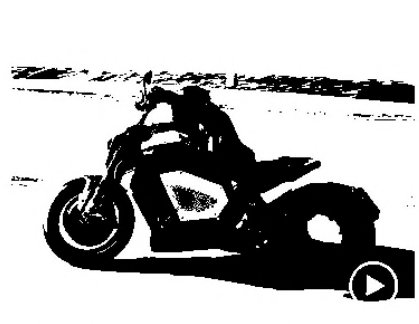
## ELECTRIC MOTORCYCLE AND SCOOTER DESIGN (302)



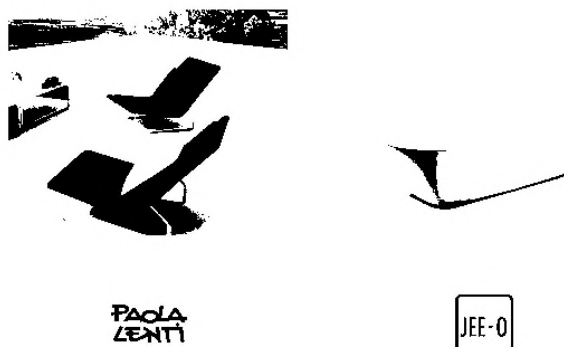
LAVOIE's series 1 e-scooter unfolds like origami with safety, stability & style



electric scooter 'TOM' folds like a swiss army knife and can charge devices as a powerbank



formula 1 driver champions new 'verge' electric superbike styled in modern steampunk flair

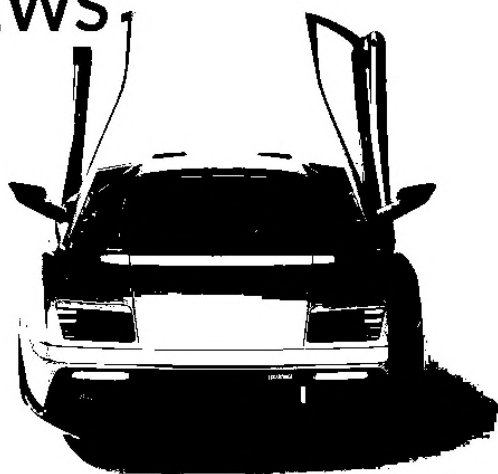


arrmet



TECHNOLOGY

## NEWS



### eccentrica's restomod lamborghini diablo hypercar in 3D-printed titanium oozes retro look

the restomod lamborghini diablo hypercar by emanuel colombini and borromeodesilva borrows its revamped design cues from diablo GTR.

[technology](#) 12K shares



### minimalist, aerodynamic changan deepal SL03 EV opens digitized cockpit

the SL03 wins the red dot design award 2023 as first all-electric car of deepal.

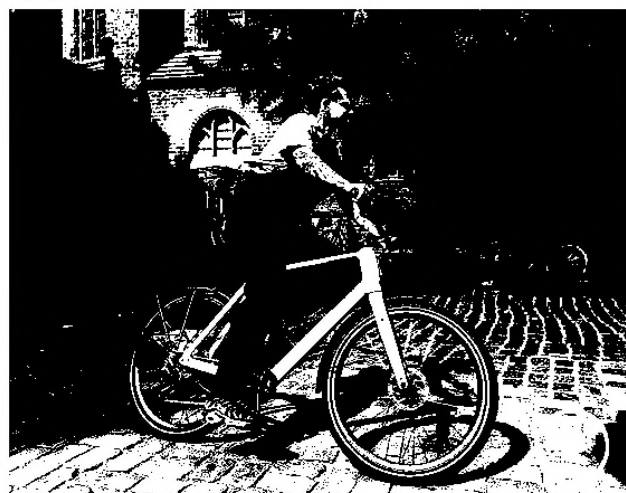
[technology](#) 179 shares



### samsung T7 shield: drop, water & dust-resistant credit card-sized portable SSD

samsung unveils T7 shield - a portable SSD that is dustproof, water-resistant, and absorbs shock from drops of up to three meters.

[technology](#) 179 shares



### LEMMO one hybrid e-bike shifts between manual/electric riding seamlessly

toni pavic, head of branding and partner at LEMMO, speaks to designboom at the red dot design award 2023 ceremony.

[technology](#) 194 shares

LASCIATE OGNI SPERANZA O VOI CHE ENTRATE

(divine comedy, dante alighieri)

we use cookies to make your reading a better experience.

**got it!**

[more info >](#)



# **EXHIBIT E**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re:	<i>EX PARTE</i> REEXAMINATION OF )	Third Party Requestor:
	U.S. PATENT NO. D854,456 )	
	)	TANLI POWER TECHNOLOGY
Issued:	7/23/2019 )	(CHONGQING) CO., LTD
	)	
Patent No.:	D854,456 )	
	)	
Inventor:	BING LI, YINGHONG CAO, )	
	SHENG CHEN, KE MA )	
	)	
Assignee:	CHONGQING QIULONG )	
	TECHNOLOGY CO. LTD )	
	)	
Title:	Light Electric Off-Road Motorcycle )	
	)	

**DECLARATION OF WANG FAN**

I, WANG FAN, declare as follows:

1. My name is Wang Fan.

**1. Background**

2. I am currently one of the co-founders and an executive at Tanli Power Tech (Chongqing) Co., LTD., Chongqing, China (PRC) (hereafter "Tanli").

3. Tanli is the third-party requester of the above-captioned Request for Reexamination..

4. I have three years' service at this company.

5. Before my current position, I worked for twenty years in motorcycle companies, including Chongqing Zongshen Motorcycle Co. Ltd. and Far-Eastern Power Co. Ltd.

6. During my professional career, including the positions outlined above, I have gained at least a decade of experience in issues related to the design and development of



motorcycles, including many years with electric motorcycles, and including the functional and design aspects of motorcycles.

7. During the aforementioned periods, I have personally conceived of and arranged for the implementation of ornamental designs, both through individual efforts and through overseeing design teams.

8. Tanli has been named as a defendant in Civil Action 23-cv-00442-RP, in the District Court of the Western District of Texas, in which US Pat D854,456 (the patent to which this Request for Reexamination is directed) has been asserted.

9. I am receiving no compensation in relation to this Declaration.

## **II. Declarations**

10. Based on my background and experience outlined above, I consider myself to be a designer of ordinary skill in the motorcycle arts, including ornamental features thereof as claimed in US Pat D854,456.

11. I have reviewed the prior art references which are the basis for the Request for Reexamination, including EU Design Registration EM2998492, which I understand is referred to in the Reexamination as the '492 Design; US Pat Pub 2015-0122568, assigned to Suzuki Motor Corp., which I understand is referred to in the Reexamination as "Suzuki"; and the Audi e bike worthersee, published by the design firm of DesignBoom on May 23, 2012, which reference I understand is referred to as "Audi." Based on my review and analysis, as a designer of ordinary skill in the motorcycle arts, I am confident with the accuracy of the statements I am making below.

### **A. The '492 Design**

12. The motorcycle depicted in the '492 Design is an electric motor-powered cycle, because among other reasons, the configuration of the engine compartment indicates an electric motor not an internal combustion engine.

13. If there were a determination made that there were not merely minor differences between the '492 Design and the '456 Patent, a designer of ordinary capability who designs motorcycle frames would be prompted to erase any such differences. It would be obvious, for example, to make changes to the pitch of the grooves already located on the front body panels of the '492 Design, or to alter the already-existing taper of the already-existing side members at the forward end of the motorcycle, especially in view of the forward, acute-angle designed aesthetic associated with motorcycles.

14. A designer of ordinary skill would likewise find such alterations readily apparent or obvious because such design elements need to merge with the functional requirements, for example, in the front panel design, to provide radiative cooling, such designs must account for louvers or slots at such locations in the motorcycle designs.

**B. The Suzuki Reference**

15. The Suzuki reference bears the title "Frame Structure for Electric Motorcycle and Support Structure Therefor." In fact, the Suzuki drawings do show an electric motorcycle design that is so related to the '492 Design that the Suzuki reference suggests to me that I could modify the '492 Design if, in fact, there were non-minor differences found between the '492 Design and the '456 Patent such as, in the swing arm assembly.

**C. The Audi Reference**

16. Similarly, with regard to the Audi reference, as a designer of ordinary skill in the motorcycle arts, electric motor-powered cycles and e bikes are considered related to each other and suggest features to each other, including the design aesthetic of making both of them sleek and light.

17. In fact, I am familiar with marketing statements made by the owner of the '456 Patent in which electric motor-powered motorcycles are compared to bicycles, for example, stating

how their Light-Bee electric motorcycle is “easy to maneuver like a bicycle,” at [www.suronusa.com](http://www.suronusa.com) (Exhibit I to this Declaration).

18. I would consider the Audi reference so related to the '492 Design that to the extent it were determined that there not merely minor differences between the '492 Design and the '456 Patent, the Audi reference would be readily used by a designer of ordinary skill to modify the primary reference as needed to erase any differences, including, for example, minor changes in the contouring of side frame members, all such modifications being well within the skillset of an ordinary designer.

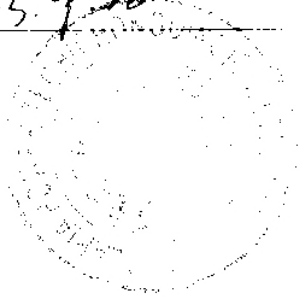
### **III. Certifications**

19. I declare that all statements made herein are true, and further that these statements were made with the full knowledge that willful false statements and the like so made are punishable by fine, imprisonment, or both, in Section 1001 or Title 18 of the United States Code.

Dated: \_\_\_\_\_

2023.9.28

227600302 v1

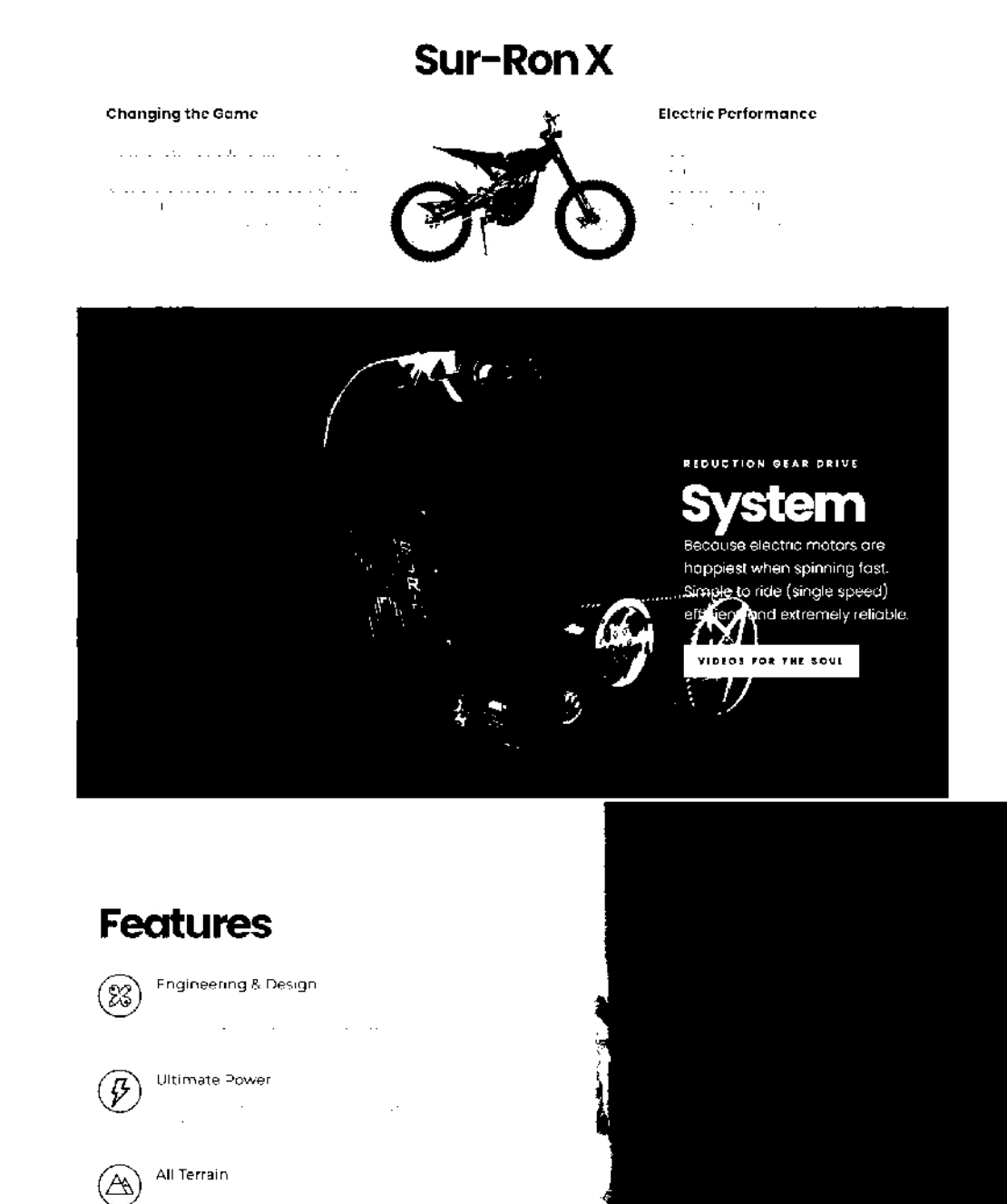
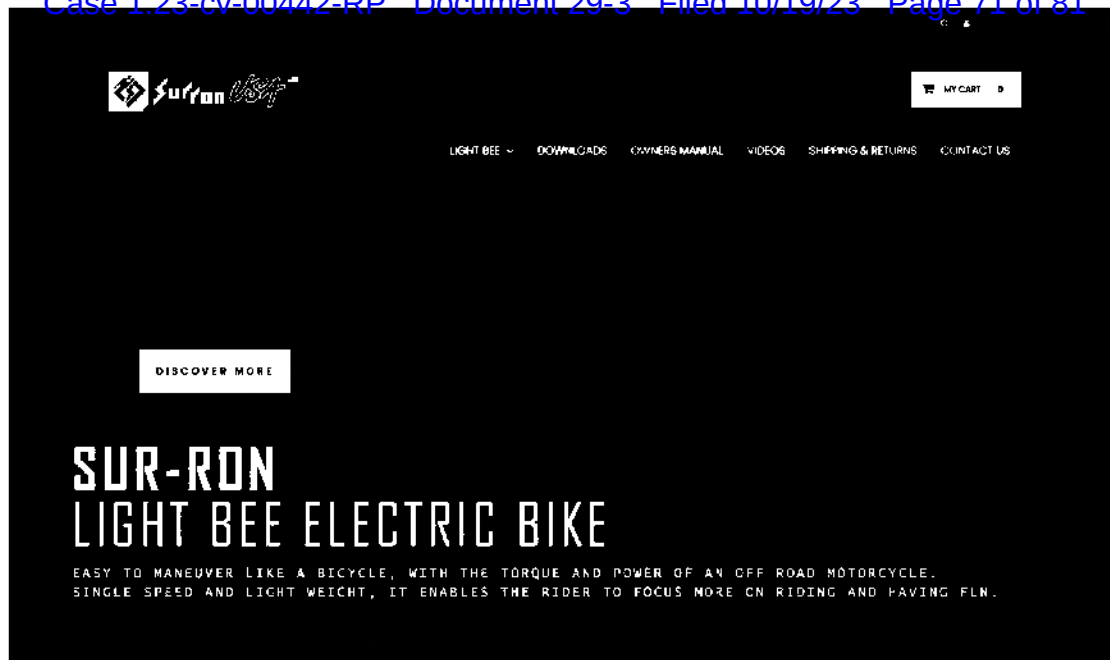


WANG FAN

WANG FAN

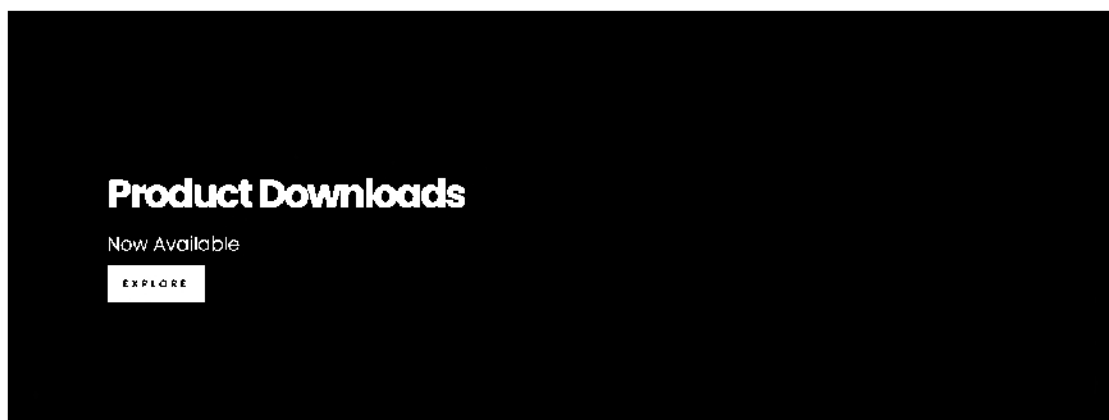
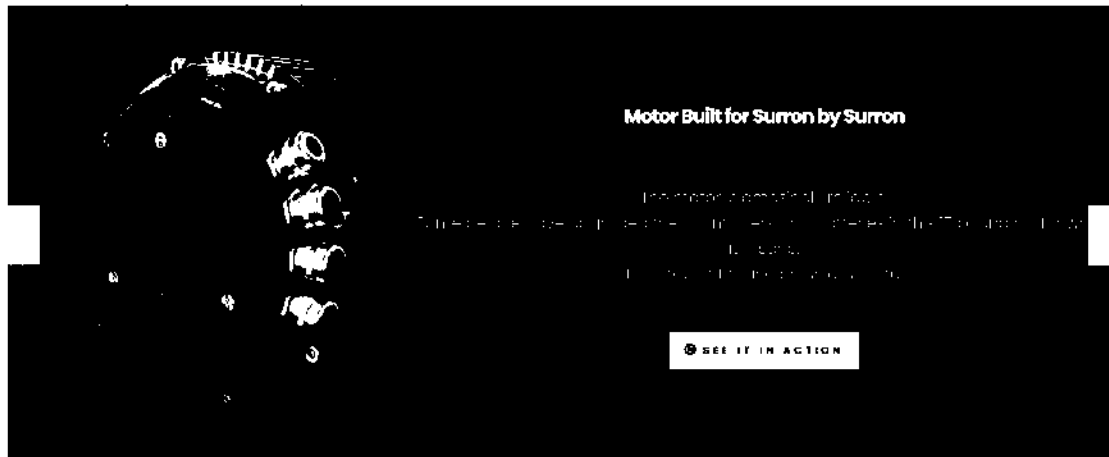


Exhibit 1 to Declaration of Wang Fan





## Elements



## Viewer







## Featured Products



★★★★★

1,000+ reviews

\$4,400.00



Contact Us

Useful links

SLR-RON USA

SEND MESSAGE

# **EXHIBIT F**

since 1999 home of design culture, leading independent publication for design, architecture, art, photography and graphics

**designboom®** search designboom

INTERVIEWS SUBMISSIONS COMPETITIONS DESIGN - AEROBICS SHOP **27,170 articles**

PRODUCT LIBRARY UPDATES VIDEO NEWSLETTER MOST POPULAR TORONTO DESIGNBOOM MART

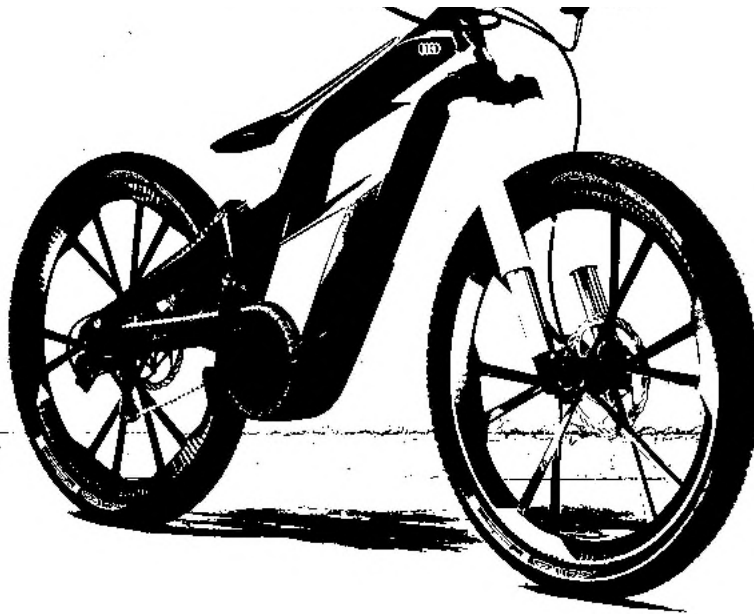
SHARE AND PROMOTE YOUR WORK

since 1999, home of design culture, designboom has been the world's first online magazine. we welcome readers to submit projects. [START UPLOADING](#)



technology

## AUDI e-bike worthersee



Share

6

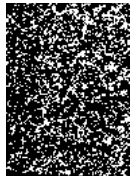
may 23, 2012

Tweet

first image  
the AUDI e-bike worthersee

at the [worthersee tour](#) in austria, [AUDI](#) unveiled its 'worthersee' performance electric bike for sports and trick cycling. designed incorporating technology from AUDI cars, with testing and feedback from competitive cyclist julien dupont. the bicycle also offers smartphone connectivity for the recording of stunts, and optional automatic stabilization when performing wheelies and other tricks. completely designed and manufactured at AUDI, the 'worthersee' offers the highest output of any production electric model at 2.3kW (a power-to-weight ratio of 9kg (19.8lb) per kilowatt). riders can use one of five travel programs, including the human-powered only 'pure' mode; 'pedelec' mixed-use, with a top speed of 50 mph (80 km/hr) and range of 31-44 miles (50 - 70 km) per charge; or 'eGrip' electric-only mode, with a top speed of 31mph (50km/hr). the e-bike's nine-speed, hydraulically actuated gear shift is modeled after the quick response of the R-tronic transmission of AUDI R8s. the lithium-ion battery pack of the 'worthersee' is easily removable, charging completely in 2.5 hours. continue reading for more about the production model of the e-bike, or see the concept sketches, early renders, and design notes at designboom's exclusive feature, ["designing the AUDI e-bike worthersee"](#).

## Product Library



Category: Bathroom / Sanitaryware

## AUDI



urban-think tank: urba  
parangole

a connectivity strategy fr  
of sao paulo which exan  
human need and desire  
movement (read more)



AUDI concept design s  
visit

earlier this month, desig  
was invited to audi's con  
design studio in munich,  
we took an (read more)



AUDI urban future awa  
winner

the firm's 'boswash' proje  
to creating a system whi  
interconnects existing m  
(read more)



AUDI urban future awa

an urban future is one th  
provides its citizens with  
unlimited means of  
transportation. see how  
(read more)



AUDI crosslane plug-ir  
coupe

blending the styling of a  
convertible and crossov  
one package, the plug-ir  
(more)

SHOW NAVIGATION

designboom © 2012

ABOUT US

ADVERTISE

CONTACT US

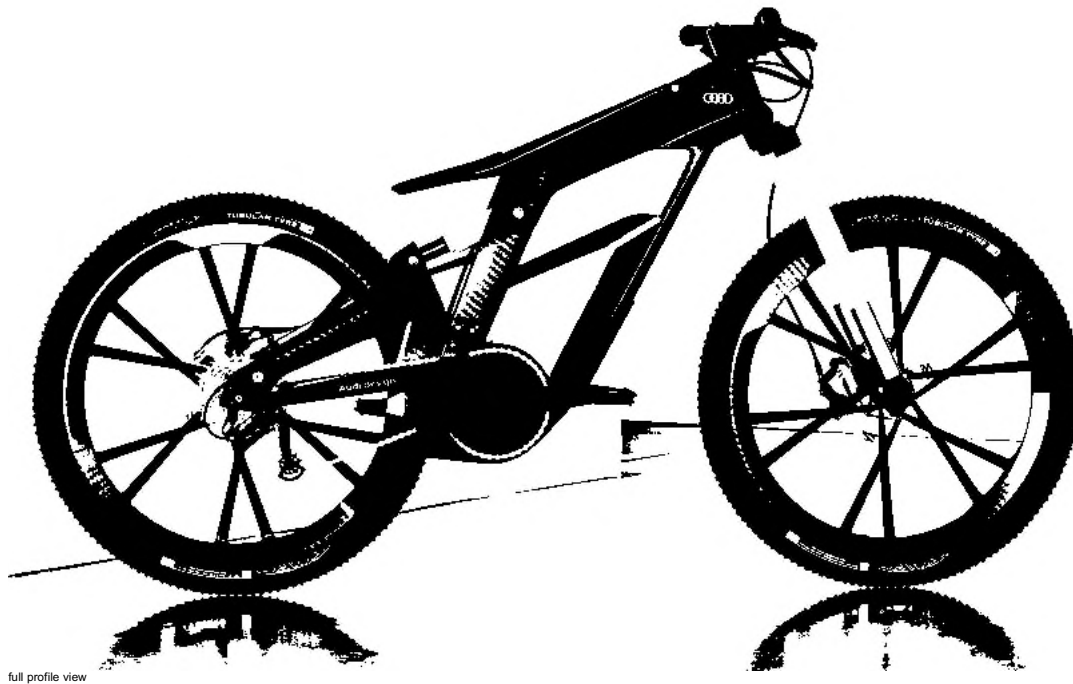
COPYRIGHT INFO

PRIVACY

NEWSLETTER



## SUBMISSIONS



full profile view

the frame of the bike is composed of lightweight carbon-fiber-reinforced polymer (CFRP) and weighs 3.53 pounds (1.6 kg); the wheels feature 2-inch CFRP rims and blade-pattern spokes, the flat design of which increase the transmission of pedal power. including the battery and motor, the bike weighs 46.3 pounds (21 kg). LED lighting is integrated into the handlebar and seat. the seat's height can be adjusted through controls on the handlebar; for example, for trick cycling, the bike's seat can be lowered to run flush with the frame, returnable to normal riding position with the touch of a button. a multimode electronic control system also supports the rider when performing backwheeling, wheelies, and other tricks.

## POPULAR TODAY

**ben godi: natural girls wooden sculptures**

the collection of wooden sculptures combines dig modeling processes and printing using >>

**micasa lab: real-time w predicting cloud lightir**

using meteorological info the light fixture collects c wi-fi to simulate the wea

**toshiba tablet man by : nature design + great c**

the garment stands as a for connecting individual through interactive expe giving >>

**imogen hedges: pedal powered un-knitting m**

built around an old bicyc the contraption reclaims unravels unwanted swea wool.

**nikon mirrorless came fieldscope attachment**

created to expand the u digiscoping, the adapter allows the camera's ape priority auto >>

## electric bikes

**bridgestone angelino e bike**

with 300,000 units already in japan, the e-bike helps e mothers with the transp of >>

**faraday porteur electric**

the elegantly equipped e propelled utility bicycle introduces a comfortable

**BMW i pedelec electric**

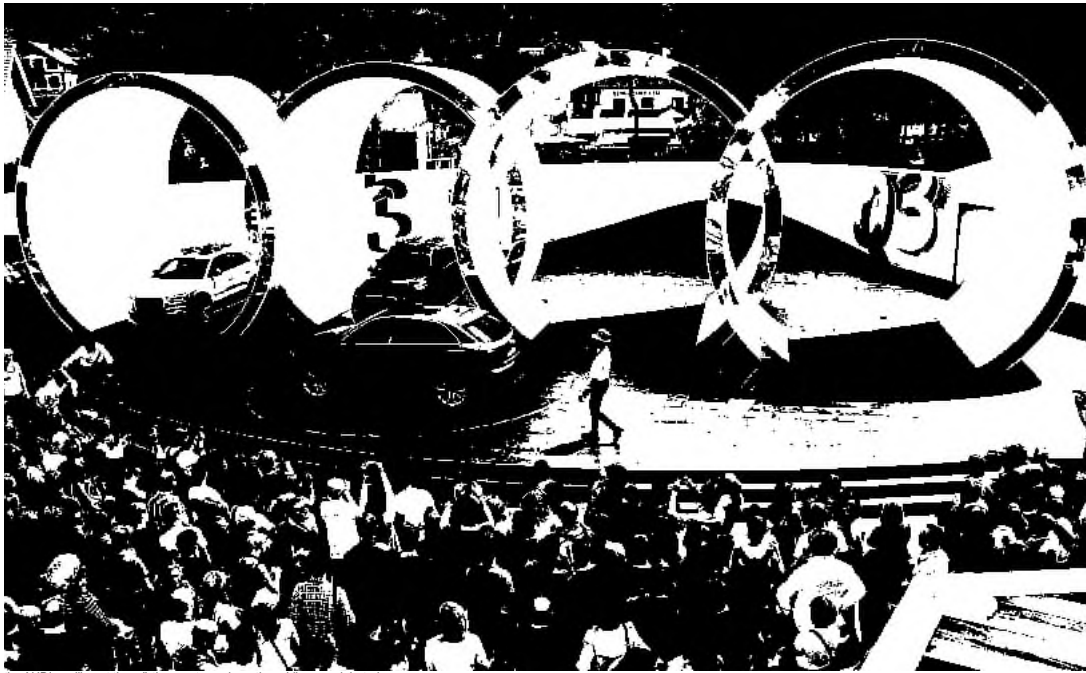
the foldable electric bike is on exhibition in the wc 'BMW i store', which just

**AUDI e-bike wörthersee**

designed for performanc trick cycling, the electric offers the highest output

julien dupont demos the production version of the AUDI e-bike wörthersee

an on-bike touchscreen computer interfaces with smartphone via WLAN, and video can be recorded via the in-helmet camera and uploaded via the mobile device to the web. an online portal lets trick cyclists compete against one another, earning points for successful tricks that have been videotaped and uploaded.



the AUDI pavilion at the wörthersee tour where the e-bike was debuted



AUDI e-bike wörthersee

developed by AUDI and by competitive cyclist jul dupont, the electric bike optimized for >>



trick cyclist julien dupont performs tricks with the 'wörthersee' on the rings of the AUDI logo at the wörthersee pavilion

SUBMISSIONS



via smartphone app or handlebar control, the bike can be set to automatically stabilize for the performing of wheelies and other tricks

additional view



SUBMISSIONS



3/4 rear view



3/4 top view

SUBMISSIONS



detail, handlebar controls



detail, nine-speed hydraulically actuated gear shift of the bike

take a behind-the-scenes look at the design of the bike in designboom's exclusive preview '[designing the AUDI e-bike wörthersee](#)'.

jenny db

05.23.12

**AUDI (28 articles)**  
**electric bikes (32 articles)**

Share

6

Tweet



Awesome, obviously, but not loving the nut-grabbing pinch-point between the "seat" and back wheel - skid marks?



NewWheel

may 23, 2012

fking yea!!! great bike



TheMalek

may 23, 2012

Awesome! Next step would be to make it affordable.



morteza

may 23, 2012

Its just amazing.

<http://www.truelocal.com.au/business/aseako-electric-bikes/maroochydore>



ASEAKO ELECTRIC BIKE

may 24, 2012

beautiful...when, where n how much?



raytham

may 25, 2012

ASL talks about this head-turning two wheeler - <http://www.asportinglife.co/audi-unveils-head-turning-wheeler/>



Jay

may 27, 2012

name (required)

e-mail (will not be published) (required)

[comments policy](#)

tips:

- to start a new line press enter
- to create a link type www

LOG IN VIA



Submit Comment

